

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 13,8 h  
Edition : 26.06.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 646 923

Injection pump  
Pump designation : PE6P130A720RS7225  
EP type number : 0 412 636 817  
Governor  
Governor design. : RQV300...900PA946  
Governor no. : 0 421 813 845

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8210.42.061

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 11.50...12.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 27.0...27.3

100 s: (26.6...27.6)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 300.0

Rack travel in mm : 4.4...4.8

Del.quantity cm3/ : 1.9...2.5

100 s: (1.5...2.9)

Spread cm3 : 1.0

100 s: (1.4)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 945

travel mm : 8.40...8.60

2nd speed rpm : 300

travel mm : 1.00...1.40

3rd speed rpm : 500

travel mm : 3.30...3.90

4th speed rpm : 700

travel mm : 5.50...5.90

5th speed rpm : 1200

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 935

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 900

Del.quantity : 270.0...273.0

1000 : (266.5...276.5)

Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 11.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1015...1045  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 75...83

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 300  
Rack travel in mm : 4.50...4.70

CONSTANT REGULATION  
Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 350  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 300  
Rack travel in m: 10.90...11.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 500  
Del.quantity cm3/ : 285.0...292.0  
1000 s: (281.5...295.5)  
Aneroid pressure h: -  
Speed rpm : 500

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Del.quantity cm3/ : 202.0...205.0  
1000 s: (198.5...208.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.40...4.80  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (15.0...29.0)  
Spread cm3 : 10.00  
1000 s: (14.00)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 926

Injection pump  
Pump designation : PE6P120A320LS7834-10  
EP type number : 0 412 626 853  
Governor  
Governor design. : RQV300...950PA797-19  
Governor no. : 0 421 813 901

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 15.20...15.40

Del. quantity cm<sup>3</sup>/ : 24.0...24.2

100 s: (23.7...24.5)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50

2nd speed rpm : 617  
travel mm : 5.00...5.50

3rd speed rpm : 780  
travel mm : 6.10...6.60

4th speed rpm : 1009  
travel mm : 8.30...8.80

5th speed rpm : 1092  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 1200  
Del.quantity : 240.0...242.0  
1000 : (237.0...245.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 13.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 82...90

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.40  
2nd pressure hPa : 250  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 750

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Rack travel in m: 13.80...14.00

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del.quantity cm3/ : 236.0...239.0  
1000 s: (233.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...230.0  
1000 s: (196.0...234.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 926X  
  
Injection pump  
Pump designation : PE6P120A320LS7834-10  
EP type number : 0 412 626 853  
Governor  
Governor design. : RQV300...950PA797-19  
Governor no. : 0 421 813 901

Cust. part no. : 0120740502

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 230.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 15.20...15.40

Del.quantity cm3/ : 24.0...24.2

100 s: (23.7...24.5)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.9

Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50

2nd speed rpm : 617  
travel mm : 5.00...5.50

3rd speed rpm : 780  
travel mm : 6.10...6.60

4th speed rpm : 1009  
travel mm : 8.30...8.80

5th speed rpm : 1092  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1020  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550  
Aneroid pressure h: 1200  
Del.quantity : 240.0...242.0  
1000 : (237.0...245.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 13.90  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1200  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 950  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.40

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.10...10.40

2nd pressure hPa : 250

Rack travel in m: 10.60...10.70

3rd pressure hPa : 750

Rack travel in m: 13.80...14.00

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950

Del.quantity cm3/ : 236.0...239.0

1000 s: (233.0...242.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 200.0...230.0

1000 s: (196.0...234.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 927

Injection pump  
Pump designation : PE6P120A320RS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RQV300...900PA712-7  
Governor no. : 0 421 813 913

Customer-spec. information  
Customer : SCANIA

Engine : DS9 05

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)

Rack travel in mm : 9.00...12.00

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Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.0

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.7)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.40...1.80

2nd speed rpm : 350

travel mm : 1.90...2.50

3rd speed rpm : 650

travel mm : 4.70...5.30

4th speed rpm : 950

travel mm : 7.90...8.10

5th speed rpm : 1045

travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1000

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 100...108

Testing:  
1st rack travel in: 11.20  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1010...1040  
4th rack travel in: 1150  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 100  
Minimum rack trave: 10.00  
Speed rpm : 300  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 330...390

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 164.0...172.0  
1000 s: (162.0...174.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (122.0...132.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (266.0...324.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.60...4.80

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 929  
  
Injection pump  
Pump designation : PE6P120A320LS7834-10  
EP type number : 0 412 626 853  
Governor  
Governor design. : RQV300...1050PA797  
-25  
Governor no. : 0 421 813 924  
  
Customer-spec. information  
Customer : MERCEDES-BENZ  
  
Engine : OM401 LA  
  
1st version kW : 230.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Overflow  
quantity min. 1/h: 100...120  
  
Test nozzle holder  
assembly : 1 688 901 105  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8  
  
Test lines : 1 680 750 075  
  
Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 550  
  
Rack travel in mm : 15.20...15.40  
  
Del.quantity cm3/ : 24.0...24.2  
100 s: (23.7...24.5)  
  
Spread cm3 : 0.6  
100 s: (0.9)  
  
2nd speed rpm : 300.0  
Rack travel in mm : 6.3...6.9  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50  
2nd speed rpm : 608  
travel mm : 4.80...5.30  
3rd speed rpm : 820  
travel mm : 5.90...6.40  
4th speed rpm : 1108  
travel mm : 8.30...8.80  
5th speed rpm : 1183  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1130  
Rack travel in mm : 12.60...15.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550  
Aneroid pressure h: 1200  
Del.quantity : 240.0...242.0  
1000 : (237.0...245.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 120...128

Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 87...92

Testing:

Speed rpm : 200  
Minimum rack trave: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.40

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.10...10.30

2nd pressure hPa : 250

Rack travel in m: 10.60...10.70

3rd pressure hPa : 750

Rack travel in m: 13.80...14.00

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...230.0  
1000 s: (196.0...234.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 26.06.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 929X  
 Injection pump  
 Pump designation : PE6P120A320LS7834-10  
 EP type number : 0 412 626 853  
 Governor  
 Governor design. : RGV300...1050PA797  
 -25  
 Governor no. : 0 421 813 924  
 Cust. part no. : 0200744102  
 Customer spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM401 LA  
 1st version kW : 230.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 550  
 Rack travel in mm : 15.20...15.40  
 Del. quantity cm<sup>3</sup>/ : 24.0...24.2  
 100 s: (23.7...24.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (0.9)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 6.3...6.9  
 Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm<sup>3</sup> : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 608  
 travel mm : 4.80...5.30  
 3rd speed rpm : 820  
 travel mm : 5.90...6.40  
 4th speed rpm : 1108  
 travel mm : 8.30...8.80  
 5th speed rpm : 1183  
 travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1130  
Rack travel in mm : 12.60...15.20

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 550  
Aneroid pressure h : 1200  
Del.quantity : 240.0...242.0  
1000 : (237.0...245.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 120...128

##### Testing:

1st rack travel in: 13.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.40

#### LOW IDLE 1

Control lever  
position degrees: 87...92

##### Testing:

Speed rpm : 200  
Minimum rack travel: 8.70  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 300...500

#### TORQUE CONTROL

Dimension a mm : 0.30  
2nd speed rpm : 1050  
Rack travel in m: 14.90...15.10  
3rd speed rpm : 800  
Rack travel in m: 15.20...15.40

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 15.20...15.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.10...10.40  
2nd pressure hPa : 250  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 750  
Rack travel in m: 13.80...14.00

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 234.0...237.0  
1000 s: (231.0...240.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...230.0  
1000 s: (196.0...234.0)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MTU  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 933  
Injection pump  
Pump designation : PES6P12DA720LS7262  
EP type number : 0 412 726 875  
Governor  
Governor design. : RQV300...1050PA1040  
Governor no. : 0 421 814 007

Customer-spec. information  
Customer : MTU

Engine : 6R183-02

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 33.0...33.2

100 s: (32.7...33.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.30

2nd speed rpm : 600

travel mm : 4.90...5.10

3rd speed rpm : 800

travel mm : 5.90...6.20

4th speed rpm : 1100

travel mm : 8.10...8.50

5th speed rpm : 1175

travel mm : 9.70...10.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1080

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1600

Del.quantity : 330.0...332.0  
1000 : (327.0...335.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68

#### Testing:

Speed rpm : 250  
Minimum rack travel: 7.50  
Speed rpm : 350  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 300...450

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1600  
Rack travel mm : 13.90...14.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.60...7.80  
2nd pressure hPa : 1200  
Rack travel in m: 13.60...13.70  
3rd pressure hPa : 400  
Rack travel in m: 9.60...9.80

#### START CUT-OUT

Speed 1/min : 230 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

A14

Aneroid pressure h: 1600  
Speed rpm : 750  
Del.quantity cm3/ : 333.0...337.0  
1000 s: (330.0...340.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 385.0...405.0  
1000 s: (381.0...409.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 16,0 a  
Edition : 03.04.92  
Replaces : 03.91  
Test oil : ISO-4113

Combination no. : 0 402 748 802

Injection pump  
Pump designation : PES8P120A920/4LS7159  
EP type number : 0 412 728 801  
Governor  
Governor design. : RQV325...1050PA848-21K  
Governor no. : 0 421 815 201

Customer-spec. information  
Customer : MACK

Engine : EE9 502

1st version kW : 368.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 7- 8- 4- 5-  
6- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 630

---

Rack travel in mm : 12.10...12.20

---

Del.quantity cm<sup>3</sup>/ : 21.1...21.3

---

100 s: (20.8...21.6)

---

Spread cm<sup>3</sup> : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 325.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm<sup>3</sup>/ : 4.0...4.6  
100 s: (3.8...4.8)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.50...1.80  
2nd speed rpm : 450  
travel mm : 2.60...3.00  
3rd speed rpm : 750  
travel mm : 4.10...4.50  
4th speed rpm : 1120  
travel mm : 7.40...7.60  
5th speed rpm : 1430  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1185  
Rack travel in mm : 11.00...13.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 630  
Aneroid pressure h: 1200  
Del.quantity : 211.0...213.0  
1000 : (208.0...216.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 112...120

Testing:  
1st rack travel in: 12.30  
Speed rpm : 1115...1125  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76

Testing:  
Speed rpm : 225  
Minimum rack travel: 7.40  
Speed rpm : 325  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION  
Speed rpm : 325...600

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 630  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 1050  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1050  
Pressure hPa : 1200  
Rack travel mm : 13.30...13.50

Measurement  
Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 9.10...9.50

2nd pressure hPa : 195  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 410  
Rack travel in m: 12.10...12.50

#### START CUT-OUT

Speed 1/min : 280 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 204.0...210.0  
1000 s: (201.0...213.0)  
Spread cm3 : 10.00  
1000 s: (14.0)  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (151.0...173.5)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 170.5...174.5  
1000 s: (168.5...176.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1115...1125

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...190.0  
1000 s: (145.0...195.0)  
Rack travel in mm : 9.50...9.90

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5178P4

\* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment,

check value for engine equipment.

Bow dimension:

Sliding-sleeve position = 37.0 mm

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1

start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 26.06.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 766 800  
 Injection pump  
 Pump designation : PES6P120A720/3LS7120  
 -3  
 EP type number : 0 412 726 878  
 Governor  
 Governor design. : RSV350...1050POA529  
 -3  
 Governor no. : 0 421 833 317

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300  
 Phasing :  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 650  
 Rack travel in mm : 14.00...14.20  
 Del.quantity cm3/ : 20.1...20.3  
 100 s: (19.8...20.6)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.6...5.8  
 Del.quantity cm3/ : 1.4...2.0  
 100 s: (1.1...2.3)  
 Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 650  
 Aneroid pressure h: 650  
 Del.quantity : 201.0...203.0  
 1000 : (198.0...206.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 90...98

### Testing:

1st rack travel in: 12.30  
Speed rpm : 1080...1085  
2nd rack travel in: 4.00  
Speed rpm : 1160...1173  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 13.30...13.50  
2nd speed rpm : 950  
Rack travel in m: 13.70...13.90  
3rd speed rpm : 875  
Rack travel in m: 14.20...14.40  
4th speed rpm : 750  
Rack travel in m: 14.70...14.90

Aneroid/Altitude  
Compensator Test

### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 650  
Rack travel mm : 14.00...14.20

### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.40  
3rd pressure hPa : 850  
Rack travel in m: 14.30...14.50  
4th pressure hPa : -  
Rack travel in m: 11.30...11.60

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1030

Del.quantity cm3/ : 190.0...193.0  
1000 s: (187.0...196.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 214.0...219.0  
1000 s: (211.0...222.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

### BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1080...1085

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (186.0...214.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB6,11  
Edition : 03.07.92  
Replaces : 03.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 246 031  
  
Injection pump  
Pump designation : PES6MW100/720RS1515  
EP type number : 0 413 206 013  
Governor  
Governor design. : RQV300...1300MW125-4  
Governor no. : 0 420 083 284

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 127.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00

A20

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 3.9...4.2

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.60...9.00

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever

position degrees: 117...125

Testing:

1st rack travel in: 10.50



Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.0

#### Testing:

Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 3.90...4.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 500  
Rack travel in m: 10.80...11.00  
3rd pressure hPa : 1000  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm3/ : 89.0...92.0  
1000 s: (86.5...94.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 35.0...37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

A21

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 3.90...4.20  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,1 I 1  
Edition : 26.06.92  
Replaces : 03.92  
Test oil : ISO-4113  
  
Combination, no. : 0 403 246 032  
  
Injection pump  
Pump designation : PES6MW100/720RS1515  
EP type number : 0 413 206 013  
Governor  
Governor design. : RQV300...1300MW125-2  
Governor no. : 0 420 083 259

Customer-spec. information  
Customer : MB-NFZ

Engine : OM366LA

1st version kW : 142.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 21.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.00...8.40

2nd speed rpm : 960

travel mm : 5.40...5.60

3rd speed rpm : 600

travel mm : 3.20...3.80

4th speed rpm : 300

travel mm : 0.80...1.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1100

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 11.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1430...1460  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

Testing:  
Speed rpm : 200  
Minimum rack travel: 5.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.70...8.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 500  
Rack travel in m: 11.40...11.60  
3rd pressure hPa : 1100  
Rack travel in m: 12.50...12.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1100  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 100.0...103.0  
1000 s: (98.0...105.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 31.0...33.0  
1000 s: (29.0...35.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 115.0...125.0  
1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL  
Edition : 26.06.92  
Replaces : 03.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 135  
  
Injection pump  
Pump designation : PES4MW100/320RS1223  
EP type number : 0 413 404 119  
Governor  
Governor design. : RGV300...1100MW122-1  
K  
Governor no. : 0 420 083 990

Customer-spec. information  
Customer : VME

Engine : TD45E

1st version kW : 92.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 173...176

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm<sup>3</sup>/ : 12.8...13.0

100 s: (12.6...13.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 2.8...3.2

100 s: (2.5...3.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

travel mm : 10.00...10.40

2nd speed rpm : 800

travel mm : 6.10...6.30

3rd speed rpm : 500

travel mm : 3.40...4.00

4th speed rpm : 300

travel mm : 1.50...1.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 750

Del.quantity : 128.0...130.0

1000 : (126.0...132.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 880  
Rack travel in m: 15.00...15.10  
3rd speed rpm : 550  
Rack travel in m: 14.20...14.30  
4th speed rpm : 750  
Rack travel in m: 14.70...14.80

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 550

1st pressure hPa : 220  
Rack travel in m: 13.10...13.20  
2nd pressure hPa : 370  
Rack travel in m: 13.60...13.90  
3rd pressure hPa : 750  
Rack travel in m: 14.20...14.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 750

Speed rpm : 880  
Del.quantity cm3/ : 133.5...136.5  
1000 s: (131.0...139.0)  
Spread cm3 : 5.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 86.0...88.0  
1000 s: (84.0...90.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 145.0...155.0  
1000 s: (142.0...158.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 139  
  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1300MW67-7  
Governor no. : 0 420 083 278

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kw : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300  
Rack travel in mm : 10.80...10.90  
Del.quantity cm3/ : 8.2...8.4  
100 s: (8.0...8.6)  
Spread cm3 : 0.3  
100 s: (0.6)  
  
2nd speed rpm : 300.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm3/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.40...8.80  
2nd speed rpm : 880  
travel mm : 4.90...5.10  
3rd speed rpm : 500  
travel mm : 2.70...3.30  
4th speed rpm : 300  
travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1350  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1300  
Aneroid pressure h: 700  
Del.quantity : 82.0...84.0  
1000 : (80.0...86.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1000  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

Measurement  
Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

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Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 4,5 Q  
Edition : 21.05.92  
Replaces : 11.91  
Test oil : ISO-4113

Combination no. : 0 403 446 287

Injection pump  
Pump designation : PES6MW100/320RS1219  
EP type number : 0 413 406 209  
Governor  
Governor design. : RQV350...1100MW118  
Governor no. : 0 420 083 249

Customer-spec. information  
Customer : VME

Engine : TD 61 GB

1st version kW : 115.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1200

travel mm : 9.00...9.40

2nd speed rpm : 1150

travel mm : 8.70...8.90

3rd speed rpm : 725

travel mm : 3.70...4.30

4th speed rpm : 350

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 112.0...114.0

1000 : (110.0...116.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Testing:

1st rack travel in: 10.60



Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.10...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 460...520

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 700  
Rack travel in m: 12.40...12.60  
3rd speed rpm : 1025  
Rack travel in m: 11.80...12.10  
4th speed rpm : 900  
Rack travel in m: 12.20...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 700  
Pressure hPa : 870  
Rack travel mm : 12.10...12.20

#### Measurement

Speed 1/min : 700

1st pressure hPa : -

Rack travel in m: 9.80...9.90

2nd pressure hPa : 250

Rack travel in m: 10.10...10.40

3rd pressure hPa : 1000

Rack travel in m: 12.40...12.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

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Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 122.5...125.5  
1000 s: (120.0...128.0)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 77.0...79.0  
1000 s: (75.0...81.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 6,2 J 1  
Edition : 13.03.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 403 446 291

Injection pump  
Pump designation : PES6MW100/320RS1214  
EP type number : 0 413 406 204  
Governor  
Governor design. : RQV275...1250MW115-1  
K  
Governor no. : 0 420 083 992

Customer-spec. information  
Customer : RVI

Engine : MIDR 060226 V

1st version kW : 129.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 033

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.20...4.30  
: (4.15...4.35)  
Rack travel in mm : 16.50...19.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 10.3...10.5

100 s: (10.1...10.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 275.0

Rack travel in mm : 6.10...6.50

Del.quantity cm<sup>3</sup>/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1330

travel mm : 9.80...10.20

2nd speed rpm : 950

travel mm : 6.90...7.10

3rd speed rpm : 550

travel mm : 3.60...4.20

4th speed rpm : 275

travel mm : 0.80...1.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 103.0...105.0

1000 : (101.0...107.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

Testing:  
1st rack travel in: 12.10  
Speed rpm : 1320...1340  
2nd rack travel in: 4.00  
Speed rpm : 1460...1500  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 238...246  
Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.30

Testing:  
Speed rpm : 200  
Minimum rack travel: 6.40  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 700  
Rack travel in m: 12.20...12.30  
3rd speed rpm : 1000  
Rack travel in m: 12.60...12.80  
4th speed rpm : 500  
Rack travel in m: 11.80...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1250  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 1250

1st pressure hPa : -  
Rack travel in m: 12.00...12.20  
2nd pressure hPa : 180  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 140  
Rack travel in m: 12.30...12.50

B03

#### START CUT-OUT

Speed 1/min : 200 (220)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 98.5...101.5  
1000 s: (96.0...104.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 1250  
Del.quantity cm<sup>3</sup>/ : 89.0...91.0  
1000 s: (87.0...93.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 1320...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...112.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 6.10...6.50  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

#### Remarks:

:  
Set start-of-delivery sensor with  
prestroke = 4.20...4.30 mm at  
cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 03.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 446 308  
Injection pump  
Pump designation : PES6MW100/32ORS1198  
EP type number : 0 413 406 188  
Governor  
Governor design. : RQV350...1200MW46-47  
Governor no. : 0 420 083 277

Customer spec. information  
Customer : NAVISTAR

Engine : DTA-466

1st version kW : 156.5  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.80...10.20

2nd speed rpm : 1250

travel mm : 7.90...8.10

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1200

Del.quantity : 122.0...124.0

1000 : (120.0...126.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 102...110

Testing:

1st rack travel in: 10.50  
Speed rpm : 1270...1290  
2nd rack travel in: 4.00  
Speed rpm : 1405...1415  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.80  
2nd pressure hPa : 245  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 395  
Rack travel in m: 10.90...11.30

START CUT-OUT

Speed 1/min : 280 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1200  
Del.quantity cm3/ : 118.5...122.5  
1000 s: (116.5...124.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 68.0...71.0  
1000 s: (66.0...73.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.50  
Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 12.50...13.50

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: IHC #1819888C91  
Only perform pump setting with original  
overflow valve without IH hose and  
restrictor 1.2 mm diameter.

In unlatched condition, do not  
operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before  
shutoff.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D  
Edition : 21.05.92  
Replaces : 01.92  
Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH 01

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 17.5...17.7

100 s: (17.3...17.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 2.8...3.2

100 s: (2.5...3.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.30...9.70

2nd speed rpm : 1255

travel mm : 6.50...6.70

3rd speed rpm : 360

travel mm : 3.90...4.50

4th speed rpm : 250

travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1400

Del.quantity : 175.0...177.0

1000 : (173.0...179.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 13.20  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 6.4

### Testing:

Speed rpm : 150  
Minimum rack travel: 8.00  
Speed rpm : 250  
Rack travel in mm : 6.30...6.50

Aneroid/Altitude  
Compensator Test

## 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 350  
Rack travel mm : 9.70...9.80

## Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.10  
2nd pressure hPa : 850  
Rack travel in m: 12.30...12.60  
3rd pressure hPa : 1400  
Rack travel in m: 14.20...14.30

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm3/ : 180.0...183.0  
1000 s: (177.5...185.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 60.0...62.0  
1000 s: (58.0...64.0)

## BREAKAWAY

## 1st version

1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

## Remarks:

: MAN #3-7126  
Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 118  
  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQV250...1200MW83-3  
Governor no. : 0 420 083 280

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF08

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 14.0...14.2

100 s: (13.8...14.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
travel mm : 10.50...10.60

2nd speed rpm : 810  
travel mm : 5.90...6.10

3rd speed rpm : 500  
travel mm : 3.70...4.30

4th speed rpm : 250  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 140.0...142.0

1000 : (138.0...144.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 120...128



Testing:

1st rack travel in: 11.40  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 330...420

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 600  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 800  
Rack travel in m: 12.80...13.00  
4th speed rpm : 1200  
Rack travel in m: 12.30...12.50

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 155  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600  
Del.quantity cm3/ : 139.5...142.5  
1000 s: (137.0...145.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7135

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 26.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 456 119  
  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-10  
Governor no. : 0 420 082 065

Customer-spec. information  
Customer : MAN

Engine : D0826LF 08/LUH05

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300  
travel mm : 8.40...8.80

2nd speed rpm : 1260  
travel mm : 6.60...6.80

3rd speed rpm : 345  
travel mm : 4.00...4.60

4th speed rpm : 250  
travel mm : 1.80...2.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 107

Speed rpm : 600

Rack travel in mm : 18.20...19.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (139.0...145.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 92...100

Setting point:

Speed rpm : 600

Rack travel in mm : 19.0

Testing:

1st rack travel in: 11.50

Speed rpm : 1245...1260

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400

Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever

position degrees: 69...77

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 5.5

Testing:

Speed rpm : 100

Minimum rack travel: 7.00

Speed rpm : 250

Rack travel in mm : 5.40...5.60

## TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 800

Rack travel in m: 12.80...12.90

2nd speed rpm : 600

Rack travel in m: 12.70...12.90

3rd speed rpm : 1000

Rack travel in m: 12.50...12.60

4th speed rpm : 1200

Rack travel in m: 12.20...12.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 155

Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.00...10.10

2nd pressure hPa : 550

Rack travel in m: 11.90...12.20

3rd pressure hPa : 1000

Rack travel in m: 12.70...12.90

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 139.5...142.5

1000 s: (137.0...145.0)

Spread cm<sup>3</sup> : 5.00

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 74.0...76.0

1000 s: (72.0...78.0)

## BREAKAWAY

1st version

1st rack travel less than

full load rack travel: 11.50

Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 60.0...80.0

1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.40...5.60

Del.quantity cm<sup>3</sup>/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm<sup>3</sup> : 5.00

1000 s: (7.00)

Remarks:

: MAN #3-7035

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 26.06.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 403 466 127

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180

Governor

Governor design. : RSV550...1100MW2A335  
-1

Governer no. : 0 420 085 185

Customer-spec. information

Customer : CUMMINS

Engine : 6 CTA-8.3

1st version kW : 194.0

Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 15.4...15.6

100 s: (15.2...15.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 1.8...2.2  
100 s: (1.6...2.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 154.0...156.0

1000 : (152.0...158.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 88...96

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.50  
Speed rpm : 1165...1175  
2nd rack travel in: 4.00  
Speed rpm : 1240...1250  
3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 750  
Rack travel in m: 15.00...15.20  
3rd speed rpm : 1000  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 15.00...15.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 400  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 630  
Rack travel in m: 13.80...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm3/ : 157.5...161.5  
1000 s: (155.5...163.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 98.0...100.0  
1000 s: (96.0...102.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 13.50  
Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 18.5...22.5  
1000 s: (16.0...25.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3911657

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 26.06.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 403 466 128

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180  
Governor  
Governor design. : RSV550...1100MW2A335  
-2

Governer no. : 0 420 085 196

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CTA-8.3

1st version kw : 176.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 14.0...14.2

100 s: (13.8...14.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 550.0

Rack travel in mm : 6.7...6.9

Del.quantity cm3/ : 2.8...3.2

100 s: (2.6...3.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1000

Del.quantity : 140.0...142.0

1000 : (138.0...144.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 86...94

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.30  
Speed rpm : 1165...1175  
2nd rack travel in: 4.00  
Speed rpm : 1240...1250  
3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.20...6.40

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 750  
Rack travel in m: 14.00...14.10  
3rd speed rpm : 1000  
Rack travel in m: 14.00...14.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 450  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 675  
Rack travel in m: 12.80...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...159.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 79.0...81.0  
1000 s: (77.0...83.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 28.5...32.5  
1000 s: (26.0...35.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3921691

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

Adjust stop lever to 0.5...1.0 mm  
before stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 D  
Edition : 03.07.92  
Replaces : 09.91  
Test oil : ISO-4113  
Combination no. : 0 403 476 081  
Injection pump  
Pump designation : PES6MW100/720RS1196-1  
EP type number : 0 413 406 219  
Governor  
Governor design. : RSV350...1050MWOA338  
Governor no. : 0 420 085 138

Customer-spec. information  
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
: (3.35...3.55)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 2.7...3.1

100 s: (2.4...3.3)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 750

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:



1st rack travel in: 10.10  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1115...1145  
3rd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.90  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.10...11.20  
2nd speed rpm : 500  
Rack travel in m: 11.10...11.20  
3rd speed rpm : 800  
Rack travel in m: 11.10...11.20  
5th speed rpm : 400  
Rack travel in m: 12.60...12.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.40...10.60

#### Measurement

Speed 1/min : 550

1st pressure hPa : 350  
Rack travel in m: 10.80...11.00  
2nd pressure hPa : 750  
Rack travel in m: 11.10...11.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 500

Del.quantity cm3/ : 127.0...130.0  
1000 s: (124.5...132.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.40  
Del.quantity cm3/ : 27.0...31.0  
1000 s: (24.5...33.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:  
Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 476 081C

Injection pump  
Pump designation : PES6MW100/720RS1196  
EP type number : 0 413 406 184  
Governor  
Governor design. : RSV350...1050MW0A338  
Governor no. : 0 420 085 138

Customer-spec. information  
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 160.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
: (3.35...3.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 4.1...4.5

Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 750

Del.quantity : 141.0...143.0

1000 : (139.0...145.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever

position degrees: 84...92

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.60

Speed rpm : 915...930  
2nd rack travel in: 4.00  
Speed rpm : 950...980  
3rd rack travel in: 4.00  
Speed rpm : 960...990  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 3.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 500  
Rack travel in mm : 3.60...4.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 11.60...11.70  
2nd speed rpm : 500  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 700  
Rack travel in m: 11.60...11.70  
5th speed rpm : 550  
Rack travel in m: 13.00...13.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 9.80...10.00

#### Measurement

Speed 1/min : 550

1st pressure hPa : 400  
Rack travel in m: 10.30...10.60  
2nd pressure hPa : 550  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 750  
Rack travel in m: 11.60...11.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 500  
Del.quantity cm3/ : 140.0...143.0  
1000 s: (137.5...145.5)

Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 103.0...105.0  
1000 s: (101.0...107.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 915...930

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 4.10...4.50  
Del.quantity cm3/ : 15.0...19.0  
1000 s: (12.5...21.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM  
Edition : 03.07.92  
Replaces : 04.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 118  
  
Injection pump  
Pump designation : PES6MW100/720RS1217-1  
EP type number : 0 413 406 214  
Governor  
Governor design. : RSV325...1200MWOA349  
Governor no. : 0 420 085 194

Customer-spec. information  
Customer : MWM

Engine : TD 226 B 6

1st version kW : 118.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10  
: (3.95...4.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1175

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 325.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1175

Aneroid pressure h: 750

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 8.20  
Speed rpm : 1220...1230  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
3rd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 325  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 0.90  
Torque control curve - 1st version  
1st speed rpm : 1175  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 750  
Rack travel in m: 10.10...10.20  
3rd speed rpm : 1025  
Rack travel in m: 9.50...9.80

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.40...8.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : 270  
Rack travel in m: 9.10...9.20  
2nd pressure hPa : 350  
Rack travel in m: 9.50...9.80  
3rd pressure hPa : 750  
Rack travel in m: 10.10...10.20

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 750  
Speed rpm : 750

Del.quantity cm3/ : 104.5...107.5  
1000 s: (102.0...110.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 62.5...64.5  
1000 s: (60.5...66.5)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1220...1230

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...110.0  
1000 s: (87.0...113.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (5.5...14.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

:  
Test electrically-released starting  
quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.07.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 403 476 120

Injection pump  
Pump designation : PES6MW100/72ORS113  
1  
EP type number : 0 413 406 165  
Governor  
Governor design. : RSV350...750MWOA336-  
6  
Governor no. : 0 420 085 198

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 87.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70  
: (3.55...3.75)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.3...6.3

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 71...79

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.50  
Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 57...61  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.30...6.30

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...6.30  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...33 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 03.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 124  
Injection pump  
Pump designation : PES6MW100/32ORS1213  
EP type number : 0 413 406 203  
Governor  
Governor design. : RSV350...1150MW8A347  
-2  
Governor no. : 0 420 085 202

Customer-spec. information  
Customer : NAVISTAR

Engine : DT-466

1st version kW : 204.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.90...15.00

Del.quantity cm3/ : 16.4...16.6

100 s: (16.2...16.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...5.2

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 164.5...166.5

1000 : (162.5...168.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800



Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.90

Speed rpm : 1160...1170

2nd rack travel in: 4.00

Speed rpm : 1230...1240

3rd rack travel in: 4.00

Speed rpm : 1235...1245

4th rack travel in: 1350

Speed rpm : 0.30...1.70

LOW IDLE

Control lever

position degrees: 66...74

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.1

Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 350

Rack travel in mm : 5.00...5.20

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 1200

Rack travel mm : 14.90...15.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 300

Rack travel in m: 11.10...11.20

3rd pressure hPa : 760

Rack travel in m: 13.40...13.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 79.5...83.5

1000 s: (77.5...85.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.90

Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 170.0...190.0

1000 s: (165.0...195.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.00...5.20

Del.quantity cm<sup>3</sup>/ : 16.0...20.0

1000 s: (13.5...22.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.00)

Remarks:

: IHC #1818557C91

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 03.07.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 476 125

Injection pump  
Pump designation : PES6MW100/320RS1198-  
1

EP type number : 0 413 406 211  
Governor  
Governor design. : RSV350...1100MW2A347  
-3

Governer no. : 0 420 085 203

Customer-spec. information  
Customer : NAVISTAR

Engine : DT-466

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.25...3.35  
: (3.20...3.40)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Phasing :  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 13.9...14.1

100 s : (13.7...14.3)

Spread cm3 : 0.3

100 s : (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3

Del.quantity cm3/ : 1.5...1.9  
100 s : (1.3...2.2)

Spread cm3 : 0.3  
100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

Del.quantity : 139.0...141.0  
1000 : (137.0...143.0)

Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 87...95

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.70  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1195...1205  
3rd rack travel in: 4.00  
Speed rpm : 1200...1210  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 64...72  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.2

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.70...12.80

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 255  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 535  
Rack travel in m: 11.80...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 83.0...87.0  
1000 s: (81.0...89.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...180.0  
1000 s: (155.0...185.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.10...5.30  
Del.quantity cm3/ : 15.5...19.5  
1000 s: (13.0...22.0)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

: IHC #1819454C91

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 13,4D12  
Edition : 26.06.92  
Replaces : 10.89  
Test oil : ISO-4113

Combination no. : 0 403 548 025

Injection pump  
Pump designation : PE8MW100/720LS1128  
EP type number : 0 413 508 103  
Governor  
Governor design. : RQ300/1150MW63-3  
Governor no. : 0 420 082 030

Customer-spec. information  
Customer : KHD

Engine : BF 8L 513

1st version kW : 225.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20  
: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-  
4- 3

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 12.90...13.00

Del.quantity cm<sup>3</sup>/ : 14.2...14.4

100 s: (14.0...14.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.5...6.7

Del.quantity cm<sup>3</sup>/ : 1.3...1.7

100 s: (1.1...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1280  
travel mm : 9.00...9.80

2nd speed rpm : 1220  
travel mm : 6.60...6.80

3rd speed rpm : 650  
travel mm : 5.70...6.30

4th speed rpm : 300  
travel mm : 1.10...1.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1000

Del.quantity : 142.0...144.0

1000 : (140.0...146.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 29...37

Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1260...1290  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.6

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION  
Speed rpm : 320...400

TORQUE CONTROL  
Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 12.90...13.00  
2nd speed rpm : 700  
Rack travel in m: 13.20...13.30  
3rd speed rpm : 800  
Rack travel in m: 13.00...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 660  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : 530  
Rack travel in m: 12.20...12.50

C01

3rd pressure hPa : 1000  
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 220 (250)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 700  
Del.quantity cm3/ : 142.5...145.5  
1000 s: (140.0...148.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 450  
Del.quantity cm3/ : 107.0...109.0  
1000 s: (105.0...111.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...150.0  
1000 s: (137.0...153.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.50...6.70  
Del.quantity cm3/ : 13.0...17.0  
1000 s: (11.0...19.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MM 2,6 a  
Edition : 29.06.92  
Replaces : 03.90  
Test oil : ISO-4113

Combination no. : 9 400 083 422

Injection pump  
Pump designation : PES3A80D320/3RS1264  
EP type number : 9 400 083 053  
Governor  
Governor design. : RSV350...1200A2B627R  
Governor no. : 9 420 082 194

Customer-spec. information  
Customer : MM

Engine : D225-3

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.40...9.50

Del.quantity cm3/ : 5.0...5.1

100 s: (4.9...5.3)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 6.9...7.1

Del.quantity cm3/ : 0.7...1.1

100 s: (0.5...1.3)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1200

Del.quantity : 50.5...51.5

1000 : (49.0...53.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 8.40

Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 16...24  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 490...550

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 500  
Rack travel in m: 9.40...9.60  
5th speed rpm : 400  
Rack travel in m: 10.60...11.20

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MMM 2,6 a 1  
Edition : 21.05.92  
Replaces : 11.89  
Test oil : ISO-4113

Combination no. : 9 400 083 423

Injection pump  
Pump designation : PES3A80D320/3RS1264  
EP type number : 9 400 083 053  
Governor  
Governor design. : RSV350...900A7B627R  
Governor no. : 9 420 082 193

Customer-spec. information  
Customer : MMM

Engine : D225-3

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 003

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 2- 3

Phasing : 0-120-240

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 7.3...7.5

Del.quantity cm3/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 9.20



Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 965...978  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 10.90...11.50

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 3,4 b 1  
 Edition : 29.06.92  
 Replaces : 03.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 427  
 Injection pump  
 Pump designation : PES4A80D320/3RS1265  
 EP type number : 9 400 083 055  
 Governor  
 Governor design. : RSV350...900A7B627R  
 Governor no. : 9 420 082 193

Customer-spec. information  
 Customer : MWM

Engine : D225-4

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 7.3...7.5

Del.quantity cm3/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control Lever

position degrees: 107...115

Testing:

1st rack travel in: 9.20

Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 965...978  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 10.90...11.50

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 5,1 a  
Edition : 29.06.92  
Replaces : 03.91  
Test oil : ISO-4113

Combination no. : 9 400 083 429

Injection pump  
Pump designation : PES6A80D320/3RS1261  
EP type number : 9 400 083 057  
Governor  
Governor design. : RSV350...900A79627R  
Governor no. : 9 420 082 193

Customer-spec. information  
Customer : MWM

Engine : D225-6

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 003

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 350.0

Rack travel in mm : 7.3...7.5

Del.quantity cm3/ : 0.7...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 107...115

Testing:

1st rack travel in: 9.20

Speed rpm : 940...945  
2nd rack travel in: 4.00  
Speed rpm : 965...978  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 420...480

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 500  
Rack travel in m: 10.20...10.40  
5th speed rpm : 400  
Rack travel in m: 10.90...11.50

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 940...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 b14  
 Edition : 21.05.92  
 Replaces : 01.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 083 458  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 -2  
 EP type number : 9 410 230 028  
 Governor  
 Governor design. : RQV350...1100AB1218-  
 1R  
 Governor no. : 9 420 080 302

Customer-spec. information  
 Customer : CUMMINS

Engine : 6 CT

1st version kW : 156.6  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
 & maximum rack tra: 21.00  
 Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 11.7...11.9

100 s: (11.5...12.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1165

travel mm : 7.90...8.10

2nd speed rpm : 350

travel mm : 2.00...2.50

3rd speed rpm : 650

travel mm : 4.50...5.00

4th speed rpm : 1330

travel mm : 9.30...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 800  
Del. quantity : 117.0...119.0  
1000 : (115.0...121.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 11.70  
Speed rpm : 1160...1170  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 70...78

Testing:  
Speed rpm : 100  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : 1.10  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.70...12.80  
2nd speed rpm : 700  
Rack travel in m: 13.80...13.90  
3rd speed rpm : 850  
Rack travel in m: 13.50...13.70  
4th speed rpm : 950  
Rack travel in m: 13.00...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

C11

1st pressure hPa : -  
Rack travel in m: 11.80...12.10  
2nd pressure hPa : 600  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 520  
Rack travel in m: 12.40...12.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 700  
Del. quantity cm3/ : 134.0...137.0  
1000 s: (131.5...139.5)  
Aneroid pressure h: 800  
Speed rpm : 900  
Del. quantity cm3/ : 126.0...129.0  
1000 s: (123.5...131.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 93.5...95.5  
1000 s: (91.5...97.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.70  
Speed rpm : 1160...1170

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 160.0...180.0  
1000 s: (-)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del. quantity cm3/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: C.D.C. # 3354617  
Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 083 460  
Injection pump  
Pump designation : PES6A100D320/3RS2827  
EP type number : 9 400 084 030  
Governor  
Governor design. : RQV350...1200AB1267R  
Governor no. : 9 420 080 319

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CTAA-8.3L

1st version kW : 179.1  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/ : 12.9...13.1

100 s: (12.7...13.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...4.9

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 8.80...9.00

2nd speed rpm : 350

travel mm : 1.40...1.90

3rd speed rpm : 550

travel mm : 3.00...3.50

4th speed rpm : 1000

travel mm : 5.90...6.40

5th speed rpm : 1320

travel mm : 9.60...10.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1220

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP



1st version

Speed rpm : 1100  
Aneroid pressure h: 1000  
Del.quantity : 129.0...131.0  
1000 : (127.0...133.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 10.40  
Speed rpm : 1240...1250  
2nd rack travel in: 4.00  
Speed rpm : 1305...1335  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 65...73

Testing:

Speed rpm : 100  
Minimum rack travel: 8.50  
Speed rpm : 350  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 750  
Rack travel in m: 12.00...12.10  
3rd speed rpm : 1100  
Rack travel in m: 12.00...12.10  
4th speed rpm : 1150  
Rack travel in m: 11.70...11.80

Aneroid/Altitude

Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 12.00...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.60...9.90

2nd pressure hPa : 370

Rack travel in m: 10.20...10.30

3rd pressure hPa : 590

Rack travel in m: 11.40...11.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 119.0...124.0  
1000 s: (117.0...126.0)  
Aneroid pressure h: 1000  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 134.0...137.0  
1000 s: (132.0...139.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 102.0...104.0  
1000 s: (100.0...106.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 166.0...180.0  
1000 s: (163.0...183.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.70...4.90  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 9 400 083 462  
  
Injection pump  
Pump designation : PES6A1000320/3RS2691  
-5  
EP type number : 9 400 084 031  
Governor  
Governor design. : RSV400...900A7C2209-  
3R  
Governor no. : 9 420 083 262

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CT 8.3 L

1st version kW : 154.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00  
& maximum rack tra: 21.00  
Difference ° CS : 3.00...4.00

## BASIC SETTING

1st speed rpm : 860

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 860

Del.quantity : 141.5...143.5

1000 : (139.5...145.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:

1st rack travel in: 12.30  
Speed rpm : 928...932  
2nd rack travel in: 4.00  
Speed rpm : 973...985  
4th rack travel in: 1100  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.3

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 415...475

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 860  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 600  
Rack travel in m: 13.30...13.50  
5th speed rpm : 450  
Rack travel in m: 13.70...14.30

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 928...932

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (132.0...158.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark at 10° cam 50  
rotation angle after start of delivery,  
cylinder 1

APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 29.06.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 339  
 Injection pump  
 Pump designation : PES4A95D410RS2774  
 EP type number : 9 400 084 019  
 Governor  
 Governor design. : RQV300...1300AB1066-11L  
 Governor no. : 9 420 080 309

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 364 LA

1st version kW : 100.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 11.40...11.50

Del. quantity cm<sup>3</sup>/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.9...7.1

Del. quantity cm<sup>3</sup>/ : 0.7...1.3

100 s: (0.5...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.10...8.30

2nd speed rpm : 300

travel mm : 0.80...1.30

3rd speed rpm : 700

travel mm : 4.00...4.50

4th speed rpm : 1000

travel mm : 5.50...6.00

5th speed rpm : 1450

travel mm : 8.90...9.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1395

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 800

Del. quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:  
1st rack travel in: 10.40  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 64...72

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 6.90...7.10

CONSTANT REGULATION  
Speed rpm : 450...600

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 11.40...11.50  
2nd speed rpm : 500  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 1050  
Rack travel in m: 11.60...11.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 800  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.50...8.80  
2nd pressure hPa : 320  
Rack travel in m: 9.20...9.40  
3rd pressure hPa : 500  
Rack travel in m: 10.70...11.00

## START CUT-OUT

Speed 1/min : 250 (270)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 700  
Del.quantity cm3/ : 96.0...99.0  
1000 s: (93.5...101.5)  
Aneroid pressure h: 800  
Speed rpm : 1050  
Del.quantity cm3/ : 98.0...101.0  
1000 s: (95.5...103.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 42.5...44.5  
1000 s: (40.5...46.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 1340...1350

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...92.0  
1000 s: (77.0...95.0)  
Rack travel in mm : 13.30...13.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.04.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 085 344  
Injection pump  
Pump designation : PES6A95D410RS2772  
EP type number : 9 400 084 018  
Governor  
Governor design. : RSV350...900A7C2076L  
Governor no. : 9 420 083 251

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 366A

1st version kW : 107.3  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
: (3.15...3.35)  
Rack travel in mm : 9.00...12.00

C20

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 860

Rack travel in mm : 10.40...10.50

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.4...1.0

100 s: (0.2...1.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 860

Del.quantity : 85.5...87.5

1000 : (83.5...89.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Testing:

1st rack travel in: 9.40

Speed rpm : 905...910

2nd rack travel in: 4.00

Speed rpm : 930...943

4th rack travel in: 1100

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 74...82

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 370...430

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 860

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 10.40...10.60

5th speed rpm : 400

Rack travel in m: 11.00...11.60

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 905...910

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...90.0

1000 s: (75.0...93.0)

Rack travel in mm : 12.70...12.90

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 4.0...10.0

1000 s: (2.0...12.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 30.04.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 9 400 085 345  
 Injection pump  
 Pump designation : PES6A95D410RS2795  
 EP type number : 9 400 084 020  
 Governor  
 Governor design. : RSV350...900A7C2076-1L  
 Governor no. : 9 420 083 252

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 366

1st version kW : 77.3  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 860

Rack travel in mm : 9.00...9.10

Del. quantity cm<sup>3</sup>/ : 6.4...6.6

100 s: (6.2...6.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.5...6.7

Del. quantity cm<sup>3</sup>/ : 0.6...1.2

100 s: (0.4...1.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 860

Del. quantity : 64.5...66.5

1000 : (62.5...68.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 106...114

Testing:

1st rack travel in: 8.00

Speed rpm : 910...915

2nd rack travel in: 4.00

Speed rpm : 931...944

4th rack travel in: 1100



Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 6.1

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 6.50...6.70

Rack travel in mm : 2.00

Speed rpm : 380...440

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 860

Rack travel in m: 9.00...9.10

2nd speed rpm : 500

Rack travel in m: 9.00...9.20

5th speed rpm : 400

Rack travel in m: 9.70...10.30

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.00

Speed rpm : 910...915

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...90.0

1000 s: (75.0...93.0)

Rack travel in mm : 12.90...13.10

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.50...6.70

Del.quantity cm3/ : 6.0...12.0

1000 s: (4.0...14.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

#### APPLICATION

Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 30.04.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 9 400 085 346

Injection pump  
 Pump designation : PES4A95D410RS2805  
 EP type number : 9 400 084 026  
 Governor  
 Governor design. : RSV350...900A7C2076-  
 2L  
 Governor no. : 9 420 083 253

Customer spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 364

1st version kW : 46.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 860

Rack travel in mm : 8.60...8.70

Del.quantity cm3/ : 5.7...5.9

100 s: (5.5...6.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.4...1.0

100 s: (0.2...1.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 860

Del.quantity : 57.5...59.5

1000 : (55.5...61.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 7.60

Speed rpm : 910...915

2nd rack travel in: 4.00

Speed rpm : 931...944

4th rack travel in: 1100

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 78...86

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 350

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 380...440

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 860

Rack travel in m: 8.60...8.70

2nd speed rpm : 500

Rack travel in m: 8.60...8.80

5th speed rpm : 400

Rack travel in m: 9.30...9.90

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.60

Speed rpm : 910...915

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...90.0

1000 s: (75.0...93.0)

Rack travel in mm : 13.30...13.50

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 6.40...6.60

Del.quantity cm3/ : 4.5...10.5

1000 s: (2.5...12.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

#### APPLICATION

Generator

Note remarks

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.30...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 400  
Rack travel in m: 10.40...10.60  
3rd pressure hPa : -  
Rack travel in m: 9.30...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 198.5...201.5  
1000 s: (195.5...204.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 202.5...205.5  
1000 s: (199.5...208.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 128.5...130.5  
1000 s: (125.5...133.5)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 29.06.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 9 400 087 425AA  
  
Injection pump  
Pump designation : PES6P120A720LS7181  
EP type number : 0 412 726 824  
Governor  
Governor design. : RQ300/1050PA911-1  
Governor no. : 0 421 801 481

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 LA

1st version kW : 294.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.30...12.50

Del.quantity cm3/ : 19.4...19.6  
100 s: (19.1...19.9)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.8...6.2  
Del.quantity cm3/ : 1.4...2.0  
100 s: (1.1...2.3)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000  
Del.quantity : 194.0...196.0  
1000 : (191.0...199.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.30...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 400  
Rack travel in m: 10.40...10.60  
3rd pressure hPa : -  
Rack travel in m: 9.30...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 198.5...201.5  
1000 s: (195.5...204.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 202.5...205.5  
1000 s: (199.5...208.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 128.5...130.5  
1000 s: (125.5...133.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

Note remarks

Combination no. : 9 400 087 425AB

1st version kW : 294.0  
Rated speed : 2100

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Speed rpm : 600  
Rack travel in mm : 20.0



#### Testing:

1st rack travel in: 12.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

#### TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 700  
Rack travel in m: 14.10...14.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 600  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80  
4th pressure hPa : 1100  
Rack travel in m: 13.90...14.10  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 229.0...233.0  
1000 s: (226.0...236.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 244.0...247.0  
1000 s: (241.0...250.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 146.0...148.0  
1000 s: (143.0...151.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 190  
Del.quantity cm3/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 29.06.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 9 400 087 433

Injection pump  
Pump designation : PES6P120A720LS7176  
EP type number : 0 412 726 821  
Governor  
Governor design. : RQ300/1050PA911-4  
Governor no. : 9 420 080 318

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 210.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.50...14.70

Del.quantity cm3/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 215.5...217.5

1000 : (212.5...220.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.60  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1260  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.00...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.60...13.80  
2nd speed rpm : 750  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 14.50...14.70

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.80...12.00  
2nd pressure hPa : 550  
Rack travel in m: 13.50...13.70  
3rd pressure hPa : 1050  
Rack travel in m: 14.70...14.80  
4th pressure hPa : -  
Rack travel in m: 10.70...11.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

D05

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 192.5...196.5  
1000 s: (189.5...199.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 220.0...223.0  
1000 s: (217.0...226.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 205.0...225.0  
1000 s: (201.0...229.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL 12,2 h1  
 Edition : 21.05.92  
 Replaces : 09.91  
 Test oil : ISO-4113  
 Combination no. : 9 400 087 434  
 Injection pump  
 Pump designation : PE6P120A32ORS3178  
 EP type number : 0 411 826 752  
 Governor  
 Governor design. : RQV250...1025PA921-2  
 Governor no. : 0 421 813 785

Customer-spec. information  
 Customer : VOLVO

Engine : TD 122 FS

1st version kW : 287.0  
 Rated speed : 2050

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.60...3.70  
 : (3.55...3.75)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 25.3...25.5

100 s: (25.0...25.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.8...5.1

Del.quantity cm3/ : 1.7...2.2

100 s: (1.5...2.5)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 1.00...1.40

2nd speed rpm : 450  
 travel mm : 3.60...4.20

3rd speed rpm : 800  
 travel mm : 6.30...6.70

4th speed rpm : 1070  
 travel mm : 8.00...8.20

5th speed rpm : 1180  
 travel mm : 9.90...10.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1200

Del.quantity : 253.0...255.0  
1000 : (250.0...258.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

#### Testing:

1st rack travel in: 13.00  
Speed rpm : 1055...1065  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 59...67

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 250  
Rack travel in mm : 4.80...5.10

#### CONSTANT REGULATION

Speed rpm : 250...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 105  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 780  
Rack travel in m: 13.50...13.70

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 163.0...165.0  
1000 s: (160.0...168.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1055...1065

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 270.0...310.0  
1000 s: (266.0...314.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.80...5.10  
Del.quantity cm3/ : 17.5...22.5  
1000 s: (15.0...25.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

Remarks:

:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 9 400 087 456  
  
Injection pump  
Pump designation : PE6P120A720RS7126  
EP type number : 0 412 626 815  
Governor  
Governor design. : RQV200...1050PA725-5  
Governor no. : 0 421 813 814

Customer-spec. information  
Customer : SCANIA

Engine : DS11

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 019  
  
Opening  
pressure, bar : 207...210  
  
Orifice plate  
diameter mm : 0,8  
  
Test Lines : 1 680 750 015  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
  
Rack travel in mm : 14.10...14.20  
  
Del.quantity cm3/ : 23.4...23.6  
100 s: (23.1...23.9)  
  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 225.0  
Rack travel in mm : 4.5...4.9  
Del.quantity cm3/ : 1.5...1.9  
100 s: (1.2...2.2)  
Spread cm3 : 0.3  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 1.20...1.60  
2nd speed rpm : 350  
travel mm : 2.30...2.90  
3rd speed rpm : 650  
travel mm : 4.00...4.60  
4th speed rpm : 1095  
travel mm : 8.20...8.40  
5th speed rpm : 1215  
travel mm : 9.70...10.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 8.00...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 900  
Del.quantity : 234.0...236.0  
1000 : (231.0...239.0)

Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 13.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 60...68

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 225  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 360...420

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.10...14.20

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.50...10.90  
2nd pressure hPa : 510  
Rack travel in m: 13.00...13.10  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1050  
Del.quantity cm3/ : 222.0...230.0  
1000 s: (220.0...232.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...325.0  
1000 s: (271.0...329.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.50...4.70

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 29.06.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 9 400 087 459AA

Injection pump  
Pump designation : PES6P120A720LS7181  
EP type number : 0 412 726 824  
Governor  
Governor design. : RQ300/1050PA911-2  
Governor no. : 9 420 080 313

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 LA

1st version kW : 298.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 12.30...12.50

Del.quantity cm<sup>3</sup>/ : 19.4...19.6

100 s: (19.1...19.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1050

Del.quantity : 194.5...196.5

1000 : (191.0...199.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0



Testing:

1st rack travel in: 11.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 12.30...12.50

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 400  
Rack travel in m: 10.40...10.60  
3rd pressure hPa : -  
Rack travel in m: 9.30...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 194.0...196.0  
1000 s: (191.0...199.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 197.0...200.0  
1000 s: (194.0...203.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 124.0...126.0  
1000 s: (121.0...129.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 265.0...285.0  
1000 s: (261.0...289.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 29.06.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 9 400 087 459AB

Injection pump  
Pump designation : PES6P120A720LS7181  
EP type number : 0 412 726 824  
Governor  
Governor design. : RQ300/1050PA911-2  
Governor no. : 9 420 080 313

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 LA

1st version kW : 298.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.1...23.3

100 s: (22.8...23.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.1)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

Del.quantity : 231.0...233.0

1000 : (228.0...236.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0  
Speed rpm : 300  
Rack travel in mm : 5.80...6.20  
Rack travel in mm : 2.00  
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.40  
2nd speed rpm : 1050  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 700  
Rack travel in m: 14.10...14.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.60...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 600  
Rack travel in m: 13.10...13.30  
3rd pressure hPa : 1000  
Rack travel in m: 13.70...13.80 \*  
4th pressure hPa : 1100  
Rack travel in m: 13.90...14.10  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 1050

Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 237.5...240.5  
1000 s: (234.5...243.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 265.0...285.0  
1000 s: (261.0...289.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

## Note remarks

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

```
1st version
Speed      rpm   : 600
Aneroid pressure h: 1050
Del.quantity : 194.5...196.5
            1000 : (191.0...199.0)
Spread     cm3   : 5.00
            1000 : (9.00)
```

## RATED SPEED

### 1st version

#### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 11.30  
Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 600  
Pressure hPa : 1050  
Rack travel mm : 12.30...12.50

#### Measurement

Speed 1/min : 600

1st pressure hPa : 300  
Rack travel in m: 11.30...11.50  
2nd pressure hPa : 400  
Rack travel in m: 10.40...10.60  
3rd pressure hPa : -  
Rack travel in m: 9.30...9.80

### START CUT-OUT

Speed 1/min : 220 (240)

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 194.0...196.0  
1000 s: (191.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 197.0...200.0  
1000 s: (194.0...203.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...127.0  
1000 s: (122.0...130.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1095...1110

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 087 464  
Injection pump  
Pump designation : PES6P120A720LS7257  
EP type number : 9 400 087 081  
Governor  
Governor design. : RQV300...1050PA1029  
Governor no. : 9 420 080 325

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 447 LA

1st version kW : 257.6  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.60...4.70  
: (4.55...4.75)  
Rack travel in mm : 21.00...0.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 25.8...26.0

100 s: (25.5...26.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.1...5.4

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1050

travel mm : 7.70...7.90

2nd speed rpm : 300

travel mm : 0.50...1.00

3rd speed rpm : 500

travel mm : 3.00...3.50

4th speed rpm : 700

travel mm : 5.20...5.70

5th speed rpm : 1165

travel mm : 9.20...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 258.0...260.0  
1000 : (255.0...263.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 12.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 700  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 850  
Rack travel in m: 13.60...13.80  
4th speed rpm : 950  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...10.90  
2nd pressure hPa : 250

Rack travel in m: 11.10...11.30  
3rd pressure hPa : 600  
Rack travel in m: 12.90...13.10

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 244.5...247.5  
1000 s: (241.5...250.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 21.05.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 9 400 087 467  
Injection pump  
Pump designation : PES5P120A720LS7174  
EP type number : 0 412 725 806  
Governor  
Governor design. : RQ300/1050PA774-8  
Governor no. : 9 420 080 328

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 449 A

1st version kW : 170.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 5

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 13.90...14.10

Del.quantity cm3/ : 19.7...19.9

100 s: (19.4...20.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...7.0

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Aneroid pressure h: 800

Del.quantity : 197.5...199.5

1000 : (194.5...202.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00



Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.8

#### Testing:

Speed rpm : 100  
Minimum rack trave: 9.50  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Rack travel in mm : 2.00  
Speed rpm : 395...435

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 800  
Rack travel mm : 13.90...14.10

##### Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 10.90...11.20  
2nd pressure hPa : 270  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 450  
Rack travel in m: 13.10...13.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 800  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 193.0...196.0  
1000 s: (190.0...199.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 131.0...133.0  
1000 s: (128.0...136.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (146.0...174.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h 2  
 Edition : 30.04.92  
 Replaces : 09.88  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 066  
 Injection pump  
 Pump designation : PES6A100D410RS2676  
 EP type number : 9 410 230 023  
 Governor  
 Governor design. : RSV425...1100A2C2161  
 -1L  
 Governor no. : 9 420 234 133

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466T

1st version kw : 120.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 32...34

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.40...9.50

Del.quantity cm3/ : 9.9...10.1

100 s: (9.7...10.3)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 425.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 2.1...2.5

100 s: (1.8...2.7)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 500

Del.quantity : 99.0...101.0

1000 : (97.0...103.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 46...54

Testing:

1st rack travel in: 8.40

Speed rpm : 1145...1155

2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 4.9

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 5.30...5.50

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.40...9.40  
2nd speed rpm : 750  
Rack travel in m: 10.60...10.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 173  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.10...9.30  
2nd pressure hPa : 80  
Rack travel in m: 9.40...9.80  
3rd pressure hPa : 500  
Rack travel in m: 10.60...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 500  
Speed rpm : 750  
Del.quantity cm3/ : 116.0...119.0  
1000 s: (114.0...121.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : -  
1000 s: (84.0...92.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (185.0...215.0)  
Rack travel in mm : 19.40...19.40

#### HIGH IDLE

1st version  
Speed rpm : 1195  
Rack travel in mm : 4.70...4.90

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 21.0...25.0  
1000 s: (18.5...27.5)  
Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE23746

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark = 15.5° after  
start of delivery cyl. 1.

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h12  
Edition : 30.04.92  
Replaces : 02.90  
Test oil : ISO-4113

Combination no. : 9 400 230 069

Injection pump  
Pump designation : PES6A100D410RS2676-1  
EP type number : 9 410 230 024  
Governor  
Governor design. : RSV450...1000A1C2186  
-1L  
Governor no. : 9 420 234 149

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466A

1st version kW : 140.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 32...34

Prestroke mm : 2.45...2.55  
: (2.40...2.60)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.60...11.60

Del.quantity cm3/ : 12.1...12.3

100 s: (11.9...12.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 450.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 121.5...123.5

1000 : (119.5...125.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 47...55

Testing:

1st rack travel in: 10.60

Speed rpm : 1045...1055

2nd rack travel in: 4.00

Speed rpm : 1080...1090  
3rd rack travel in: 4.00  
Speed rpm : 1070...1100  
4th rack travel in: 1150  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 23...31  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.80...6.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 11.60...11.60  
2nd speed rpm : 700  
Rack travel in m: 12.50...12.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 700  
Del.quantity cm3/ : 132.0...135.0  
1000 s: (130.0...137.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.60  
Speed rpm : 1045...1055

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (185.0...215.0)  
Rack travel in mm : 19.00...21.00

#### HIGH IDLE

##### 1st version

Speed rpm : 1075  
Rack travel in mm : 5.90...6.10

#### LOW IDLE

Speed rpm : 450

Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE28030

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1

#### APPLICATION

Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h7  
Edition : 30.04.92  
Replaces : 6  
Test oil : ISO-4113

Combination no. : 9 400 230 072

Injection pump  
Pump designation : PES6A100D410RS2676  
EP type number : 9 410 230 023  
Governor  
Governor design. : RSV400...1100A2B2086  
-1L  
Governor no. : 9 420 234 109

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466T

1st version kW : 132.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 32...34

Prestroke mm : 2.45...2.55  
: (2.40...2.60)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.30...10.40

Del.quantity cm3/ : 11.0...11.2

100 s: (10.8...11.4)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.2...5.4

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 700

Del.quantity : 110.0...112.0

1000 : (108.0...114.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 9.30

Speed rpm : 1145...1155

2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1  
Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.8

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.20...5.40

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 10.30...10.40  
2nd speed rpm : 750  
Rack travel in m: 11.70...11.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 700  
Rack travel mm : 11.70...11.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 215  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 65  
Rack travel in m: 9.90...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 126.0...130.0  
1000 s: (124.0...132.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 87.0...91.0  
1000 s: (85.0...93.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.30  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.20...5.40  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
1000 s: (10.5...19.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:  
: JOHN DEERE # RE18160

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark = 15.5° after  
start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h9  
 Edition : 30.04.92  
 Replaces : 6  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 078  
 Injection pump  
 Pump designation : PES6A100D410RS2676-1  
 EP type number : 9 410 230 024  
 Governor  
 Governor design. : RSV500...900A1B2186-3L  
 Governor no. : 9 420 234 115

Customer-spec. information  
 Customer : JOHN DEERE

Engine : 6466A

1st version kW : 128.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 32...34

Prestroke mm : 2.45...2.55  
 : (2.40...2.60)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm3 : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 118.0...120.0

1000 : (116.0...122.0)

Spread cm3 : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 9.90

Speed rpm : 930...940

2nd rack travel in: 4.00



Speed rpm : 975...985  
3rd rack travel in: 4.00  
Speed rpm : 965...995  
4th rack travel in: 1050  
Speed rpm : 0.30...1.40

: JOHN DEERE # RE19917

Start-of-delivery mark at 14° angular displacement of the cam after start of delivery of cylinder 1

LOW IDLE 1  
Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 4.5

Testing:  
Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 500  
Rack travel in mm : 4.90...5.10

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 650  
Rack travel in m: 12.10...12.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 132.0...136.0  
1000 s: (130.0...138.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 9.90  
Speed rpm : 930...940

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 7,6 h 5  
Edition : 30.04.92  
Replaces : 12.91  
Test oil : ISO-4113

Combination no. : 9 400 230 085

Injection pump  
Pump designation : PES6A100D410RS2676-1  
EP type number : 9 410 230 024  
Governor  
Governor design. : RSV450...1100A2C2204  
L  
Governor no. : 9 420 234 121

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6466T

1st version kW : 119.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 32...34

Prestroke mm : 2.45...2.55  
: (2.40...2.60)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 9.9...10.1  
100 s: (9.7...10.3)

Spread cm3 : 0.4  
100 s: (0.6)

2nd speed rpm : 450.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 1.7...2.1  
100 s: (1.5...2.4)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Del.quantity : 99.5...101.5  
1000 : (97.5...103.5)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 45...53

Testing:

1st rack travel in: 8.80  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1210...1220  
3rd rack travel in: 4.00  
Speed rpm : 1200...1230  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 450  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 450  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 500  
Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...210.0  
1000 s: (185.0...215.0)

#### LOW IDLE

Speed rpm : 450  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 17.5...21.5  
1000 s: (15.0...24.0)

Spread cm3 : 6.00  
1000 s: (8.00)

#### Remarks:

: JOHN DEERE # RE19919  
Start-of-delivery mark at control-rod  
travel 10.5 mm and 15° after start of  
delivery.

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 a 6  
 Edition : 7.7.92  
 Replaces : 12.88  
 Test oil : ISO-4113  
 Combination no. : 9 400 230 109  
 Injection pump  
 Pump designation : PES6A100D320/3RS2691  
 EP type number : 9 410 230 030  
 Governor  
 Governor design. : RSV400...1100A0C2190  
 -21R  
 Governor no. : 9 420 234 164

Customer-spec. information  
 Customer : C.D.C.

Engine : 6CT830

1st version kw : 117.1  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 017

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

E02

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-130-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 10.20...10.30

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 7.8...8.0

Del.quantity cm3/ : 3.2...3.6

100 s: (3.0...3.8)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 5.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

1st rack travel in: 9.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control Lever  
position degrees: 25...33  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 7.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 7.80...8.00  
Rack travel in mm : 2.00  
Speed rpm : 515...575

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100  
Rack travel in m: 10.20...10.30  
2nd speed rpm : 750  
Rack travel in m: 10.80...11.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 90.5...94.5  
1000 s: (88.5...96.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 7.80...8.00  
Del. quantity cm<sup>3</sup>/ : 32.5...36.5  
1000 s: (30.5...38.5)

EO3

Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

: C.D.C. # 3911541

Adjustment without torque-control  
spring retainer with 1 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE 10,1 e  
Edition : 7.7.92  
Replaces : 9.87  
Test oil : ISO-4113  
Combination no. : 9 400 231 013  
Injection pump  
Pump designation : PES6P110A720RS379  
Governor  
Governor design. : RSV400...1050P0/457  
DR

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6619 T

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00X1,50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 10.20  
Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

E04

Tolerance + - ° : 0.5 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 10.20  
Del.quantity cm<sup>3</sup>/ : 13.5...13.7  
100 s : (13.2...14.0)  
Spread cm<sup>3</sup> : 0.4  
100 s : (-)

2nd speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm<sup>3</sup>/ : 2.1...2.7  
100 s : (-)  
Spread cm<sup>3</sup> : 0.4  
100 s : (-)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 800  
Del.quantity : 135.0...137.0  
1000 : (132.0...140.0)  
Spread cm<sup>3</sup> : 4.0  
1000 : (-)

## RATED SPEED

1st version  
Control lever  
position degrees: 43...51

Testing:  
1st rack travel in: 9.20  
Speed rpm : 1095...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

## LOW IDLE 1

Control lever  
position degrees: 22.5...30.5  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.40

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 10.20  
2nd speed rpm : 630  
Rack travel in m: 10.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 550  
Pressure hPa : 380  
Rack travel mm : 10.45...10.55

Measurement  
Speed 1/min : 550

1st pressure hPa : 250  
Rack travel in m: 9.90...10.30

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 630  
Del.quantity cm3/ : 145.0...149.0  
1000 s: (142.0...151.0)  
Spread cm3 : 6.0  
1000 s: (-)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 113.6...121.6  
1000 s: (110.6...124.6)  
Spread cm3 : 6.0  
1000 s: (-)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.20  
Speed rpm : 1095...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...  
1000 s: (-)  
Rack travel in mm : 19.0...21.0

#### HIGH IDLE

1st version  
Speed rpm : 1150  
Rack travel in mm : 6.1...6.3  
Del.quantity cm3/ : 45.0...55.0  
1000 s: (-)

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 20.8...26.8  
1000 s: (-)

#### Remarks:

: JOHN DEERE # AR88759

Start-of-delivery mark at 14° angular  
displacement of the cam after start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 11,0 w3  
 Edition : 26.6.91  
 Replaces : 2.4.90  
 Test oil : ISO-4113  
 Combination no. : 9 400 231 187  
 Injection pump  
 Pump designation : PES6P110A720RS6005-1  
 Governor  
 Governor design. : RGV300/600...1050PA  
 586-3K

Cust. part no. : \*

Customer-spec. information  
 Customer : MACK

Engine : EM6-285

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Inlet press., bar : 0.3

Test nozzle holder  
 assembly : \*

Opening  
 pressure, bar : 300...308

Test lines : 9 681 230 727

Outside diameter  
 x Wall thickness  
 x Length mm : 6.35X1.70X990.6

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2.8...2.9  
 : (2.75...2.95)  
 Rack travel in mm : 10.50  
 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.5 (0.75)

## BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 13.20...13.30  
 Del.quantity cm3/ : 16.0...16.2  
 100 s : (15.8...16.4)  
 Spread cm3 : 0.5  
 100 s : (0.75)

2nd speed rpm : 300  
 Rack travel in mm : 4.40...4.60  
 Del.quantity cm3/ : 2.4...2.9  
 100 s : (2.2...2.9)  
 Spread cm3 : 0.7  
 100 s : (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1120  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 160.5...162.5  
 1000 : (158.5...164.5)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 56.5...61.5

Testing:  
 1st rack travel in: 12.20  
 Speed rpm : 1090...1100  
 2nd rack travel in: 4.00  
 Speed rpm : 1185...1215  
 4th rack travel in: 1240  
 Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
 position degrees: 14.5...19.5

Testing:  
 Speed rpm : 250  
 Minimum rack travel: 8.90  
 Speed rpm : 400



Rack travel in mm : 5.40...6.80  
Rack travel in mm : 2.00  
Speed rpm : 670...730

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 1000  
Rack travel in m: 13.15...13.25  
3rd speed rpm : 700  
Rack travel in m: 13.75...13.85  
4th speed rpm : 600  
Rack travel in m: 14.15...14.25  
5th speed rpm : 500  
Rack travel in m: 13.65...13.75

#### FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800  
Del.quantity cm3/ : 184.0...189.0  
1000 s: (182.0...191.0)  
Speed rpm : 600  
Del.quantity cm3/ : 222.5...226.5  
1000 s: (220.0...228.5)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (150.0...210.0)  
Rack travel in mm : 10.60...10.70

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 24.5...29.5  
Del.quantity cm3/ : (22.5...31.5)

Remarks:

: MACK #313 GC 5148 P  
: 31

See VDT-I-MAC 002

PLE dimension = 0.740" - 0.820"

The test specifications apply to test-

E07

ing of the injection-pump assembly with  
the genuine engine/nozzle-and-holder  
assembly

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 08.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/10F1600L481  
Type number : 0 460 403 015  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 394 HT

Power KW: 51

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 2.40...2.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000

E08

Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 67.00...68.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 59.00...60.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 10.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1700  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 37.00...43.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...110.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Inj.-qty. cm3/  
difference 1000S.: -12.00...20.00#  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1200  
TD-travel  
difference mm: -0.80...1.00#  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1200  
Charge press hPa: 1000  
Supply pump  
pressure  
difference bar: -0.10...0.30\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 3.50...4.30  
mm: (3.20...4.60)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press hPa: 1000  
TD travel mm: 2.40...2.80  
mm: (1.90...3.30)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.80...4.40

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 5.0  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.50...62.50  
1000S.: (59.00...65.00)

3rd speed 1/min: 1700  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (34.00...46.00)

9th speed 1/min: 1500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.00...67.00  
1000S.: (62.50...68.50)

12th speed 1/min: 1200  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quynntity cm<sup>3</sup>/: 67.00...68.00  
1000S.: (64.50...70.50)

16th speed 1/min: 750  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 55.50...59.50  
1000H.: -

18th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 59.00...60.00  
1000S.: (56.50...62.50)

20th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 66.50...69.50  
1000S.: (65.00...71.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 10.50...14.50  
1000S.: (7.50...17.50)

Dispersion cm3/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 440  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.00...8.00  
1000S.: (1.00...9.00)

3rd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm3/ : -6.00...8.00\*  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Inj.-qty. cm3/: -12.0...20.0#  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):

1st speed 1/min: 1200  
TD-travel : 0.80...1.00#  
difference mm: -

Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:

pompa di mandata (FP):  
1st speed 1/min: 1200  
Charge press. hPa: 1000

Supply pump-  
pressure : -0.10...0.30\*  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...70.00  
1000S.: (50.00...70.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...110.00  
1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.8...6.2  
MS mm: 0.6...1.0  
Ya mm: 37.2...39.2  
Yb mm: 48.3...56.5

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 09.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE3/10F160DL483  
Type number : 0 460 403 016  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR 394 H

Power KW: 39

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Setting value mm: 2.50...2.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Setting value bar: 5.30...5.90

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Del. quantity cm3/  
1000S.: 45.50...46.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (3.5)

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 10.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 1620  
Del. quantity cm3/  
1000S.: 21.00...27.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...100.00  
mind 1000S.: 60.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: -18.00...26.00\*

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1200  
TD-travel  
difference mm: -0.80...1.00\*

Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1200

Supply pump  
pressure  
difference bar: -0.10...0.30#  
Shutoff  
electromagnet Volt: 12

Inspection pump test specifications  
Test specifications in parentheses

Timing device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 3.60...4.40  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1200  
TD travel mm: 2.50...2.90  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 1000  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply pump pressure characteristic:

1st speed 1/min: 600  
Supply pump  
pressure bar: 2.80...3.40  
Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1200  
Supply pump  
pressure bar: 5.30...5.90  
Shutoff  
electromagnet Volt: 12

4th speed 1/min: 1500  
Supply pump  
pressure bar: 6.60...7.20  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (26.70...98.40)

2nd speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery quant. and breakaway char.:

2nd speed 1/min: 1700  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1620  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 21.00...27.00  
1000S.: (18.00...30.00)

8th speed 1/min: 1550  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.00...47.00  
1000S.: (36.00...48.00)

9th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 44.00...47.00  
1000S.: (42.50...48.50)

12th speed 1/min: 1200  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 45.50...46.50  
1000S.: (43.50...48.50)

20th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 46.00...49.00  
1000S.: (44.50...50.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 10.50...14.50  
1000S.: (8.50...16.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 440  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 2.00...8.00  
1000S.: (1.00...9.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Inj.-qty. cm3/ : -15.0..17.0#  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1200  
Inj.-qty. cm3/: -18.0..26.0\*  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
TD-travel : -0.80...1.00\*  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Supply pump-  
pressure : -0.10...0.30#  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 65.00...95.00  
1000S.: (65.00...95.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 60.00...100.00  
1000S.: (60.00...100.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

E13

K	mm: 3.2...3.4
KF	mm: 5.8...6.2
MS	mm: 0.6...1.0
Ya	mm: 37.2...39.2
Yb	mm: 51.5...59.7

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 09.07.92  
replaces : 01.08.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L297  
Type number : 0 460 404 055  
Customer Part-No. :

Customer-specific information  
Customer : OPEL

Engine : 2,3 YDR

Power KW: 74

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 5.10...5.50

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...63.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 38.00...39.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

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Low-idle speed regulation

Speed 1/min: 290  
Del. quantity cm3/  
1000S.: 13.50...17.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 15.00...21.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12



Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
mind 1000S.: 57.00

KSB/AFB

Valve Volt: 12

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -10.00...18.00\*

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

TD-travel dif.measurement

correttore anticipo iniezione (SV)

1.Speed 1/min: 1500

TD-travel

difference mm: -0.20...0.40\*

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1500

Supply pump

pressure

difference bar: -0.10...0.30#

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 7.40...8.20  
mm: (7.10...8.50)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press hPa: 1000

TD travel mm: 5.10...5.50  
mm: (4.60...6.00)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 800

Charge press hPa: 1000

TD travel mm: 1.50...2.30  
mm: (1.20...2.60)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

5th speed 1/min: 1200

Charge press. hPa: 1000

TD travel mm: 3.70...4.30  
mm: (3.30...4.70)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

9th speed 1/min: 300

Charge press. hPa: 1000

TD travel mm: 2.70...4.30 A  
mm: (2.30...4.70)

Shutoff

electromagnet Volt: 12

10th speed 1/min: 800

Charge press. hPa: 1000

TD travel mm: 3.80...6.20 B  
mm: (3.20...6.80)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100

Charge press. hPa: 1000

Supply-pump

pressure bar: 6.50...7.10

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1500

Charge press. hPa: 1000

Supply-pump

pressure bar: 5.10...5.70

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1200

Charge press. hPa: 1000

Supply-pump

pressure bar: 4.40...5.00

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 300

Charge press. hPa: 1000

Supply-pump  
 pressure bar: 4.20...4.80  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 6.5  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
 1000S.: (53.00...59.00)  
 2nd speed 1/min: 2700  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 2500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...21.00  
 1000S.: (14.00...22.00)  
 8th speed 1/min: 2300  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.00...43.00  
 1000S.: -

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.80...53.20  
 1000S.: (49.70...54.30)  
 10th speed 1/min: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.50...41.50  
 1000S.: -  
 12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 62.50...63.50  
 1000S.: (60.70...65.30)  
 18th speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.00...39.00  
 1000S.: (36.20...40.80)  
 20th speed 1/min: 800  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 59.50...62.50  
 1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 290  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 290  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.50...17.50  
 1000S.: (11.50...19.50)  
 Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 380

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...2.60  
1000S.: (0.00...2.60)  
3rd speed 1/min: 320  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...13.00  
1000S.: (6.50...13.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm3/ : -6.00...8.00#  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm3/: -10.0...18.0\*  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -0.20...0.40\*  
difference mm: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...0.30#  
difference bar: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 55.00...65.00  
1000S.: (55.00...65.00)

2nd speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 43.00...53.00  
1000S.: (43.00...53.00)

3rd speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 57.00...59.00  
1000S.: (50.00...66.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.8...1.2  
Ya mm: 20.5...22.5  
Yb mm: 59.2...73.2

Remarks:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 09.07.92  
replaces : 19.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L297-1  
Type number : 0 460 404 056  
Customer Part-No. :

Customer-specific information  
Customer : OPEL

Engine : 2,3 YDT

Power KW: 74

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.70...3.10

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 4.20...4.80

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...63.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 40.50...41.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 290  
Del. quantity cm3/  
1000S.: 13.50...17.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 15.00...21.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
mind 1000S.: 57.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -22.00...24.00\*  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1000  
TD-travel  
difference mm: -1.20...1.40\*  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 8.00...8.80  
mm: (7.70...9.10)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.70...3.10  
mm: (2.20...3.60)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

5th speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: 5.20...5.80  
mm: (4.80...6.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 300  
Charge press. hPa: 1000  
TD travel mm: 1.50...3.50 A  
mm: (1.30...3.70)

Shutoff  
electromagnet Volt: 12  
10th speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 3.50...5.90 B  
mm: (2.90...6.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.90...7.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.20...4.80

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.70...4.30

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 300  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.20...4.80

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (26.70...98.40)  
 2nd speed 1/min: 2150  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 6.5  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 55.50...56.50  
 1000S.: (53.00...59.00)  
 2nd speed 1/min: 2700  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: -  
 5th speed 1/min: 2500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 15.00...21.00  
 1000S.: (14.00...22.00)  
 8th speed 1/min: 2300  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 35.00...43.00  
 1000S.: (34.00...44.00)  
 9th speed 1/min: 2150  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 50.30...52.70  
 1000S.: (49.20...53.80)  
 10th speed 1/min: 2100  
 Charge press. hPa: 1000

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 51.30...53.70  
 1000S.: -  
 12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 62.50...63.50  
 1000S.: (60.70...65.30)  
 16th speed 1/min: 800  
 KSB solenoid-operated  
 valve volt: 12  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm3/: 40.50...43.50  
 1000H.: -  
 18th speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.50...41.50  
 1000S.: (38.70...43.30)  
 20th speed 1/min: 800  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 60.50...63.50  
 1000S.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 290  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 290  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 13.50...17.50  
 1000S.: (11.50...19.50)  
 Dispersion cm3/: 3.0  
 1000S.: (3.0)  
 2nd speed 1/min: 380  
 KSB/AFB  
 valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 320  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (6.50...13.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

3rd speed 1/min: 1000  
Inj.-qty. cm<sup>3</sup>/: -22.0...24.0\*  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1000  
Inj.-qty. cm<sup>3</sup>/: -1.50...1.50#  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1000  
TD-travel : -1.20...1.40\*  
difference mm: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD-travel : -0.50...1.10#  
difference mm: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 53.00...63.00  
1000S.: (50.00...66.00)

2nd speed 1/min: 400  
KSB/AFB  
valve Volt: 12

E21

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...50.00  
1000S.: (40.00...50.00)

3rd speed 1/min: 100

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
1000S.: (50.00...66.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.8...1.2  
Ya mm: 37.9...39.9  
Yb mm: 39.2...44.8

Remarks:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 09.07.92  
replaces : 01.08.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2100L297-2  
Type number : 0 460 404 057  
Customer Part-No. :

Customer-specific information  
Customer : OPEL

Engine : 2,3 YDT

Power KW: 74

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 5.10...5.50

AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...63.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 38.00...39.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 290  
Del. quantity cm3/  
1000S.: 13.50...17.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 15.00...21.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12



Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
mind 1000S.: 57.00

KSB/AFB

Valve Volt: 12

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -10.00...18.00#

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

TD-travel dif.measurement

correttore anticipo iniezione (SV)

1.Speed 1/min: 1500

TD-travel

difference mm: -0.20...0.40#

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1500

Supply pump

pressure

difference bar: -0.10...0.30\*

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 7.40...8.20  
mm: (7.10...8.50)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Charge press hPa: 1000

TD travel mm: 5.10...5.50

mm: (4.60...6.00)

KSB/AFB

valve Volt: 12

E23

Shutoff

electromagnet Volt: 12

4th speed 1/min: 800

Charge press hPa: 1000

TD travel mm: 1.50...2.30

mm: (1.20...2.60)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

5th speed 1/min: 1200

Charge press. hPa: 1000

TD travel mm: 3.70...4.30

mm: (3.30...4.70)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

9th speed 1/min: 300

Charge press. hPa: 1000

TD travel mm: 2.70...4.30 A

mm: (2.30...4.70)

Shutoff

electromagnet Volt: 12

10th speed 1/min: 800

Charge press. hPa: 1000

TD travel mm: 3.80...6.20 B

mm: (3.20...6.80)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100

Charge press. hPa: 1000

Supply-pump

pressure bar: 6.50...7.10

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1500

Charge press. hPa: 1000

Supply-pump

pressure bar: 5.10...5.70

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1200

Charge press. hPa: 1000

Supply-pump

pressure bar: 4.40...5.00

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

4th speed 1/min: 300

Charge press. hPa: 1000

Supply-pump  
 pressure bar: 4.20...4.80  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (26.70...98.40)  
 2nd speed 1/min: 2100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 120  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (40.60...154.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 6.5  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.50...56.50  
 1000s.: (53.00...59.00)

2nd speed 1/min: 2700  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)

5th speed 1/min: 2500  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...21.00  
 1000s.: (14.00...22.00)

8th speed 1/min: 2300  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 35.00...43.00  
 1000s.: -

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.80...53.20  
 1000s.: (49.70...54.30)

10th speed 1/min: 800  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.50...41.50  
 1000s.: -

12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 62.50...63.50  
 1000s.: (60.70...65.30)

18th speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 38.00...39.00  
 1000s.: (36.20...40.80)

20th speed 1/min: 800  
 Charge press. hPa: 1000  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 59.50...62.50  
 1000s.: -

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 290  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 290  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.50...17.50  
 1000s.: (11.50...19.50)

Dispersion cm<sup>3</sup>/: 3.0  
 1000s.: (3.0)

2nd speed 1/min: 380

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...2.60  
1000S.: (0.00...2.60)  
3rd speed 1/min: 320  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (6.50...13.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -6.00...8.00\*  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/: -10.0...18.0#  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1500  
TD-travel : -0.20...0.40#  
difference mm: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1500  
Supply pump-  
pressure : -0.10...0.30\*  
difference bar: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 55.00...65.00  
1000S.: (55.00...65.00)

2nd speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.00...53.00  
1000S.: (43.00...53.00)

3rd speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 57.00...59.00  
1000S.: (50.00...66.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.6...6.0  
MS mm: 0.8...1.2  
LDA stroke mm: 6.5  
Ya mm: 5.0...7.0  
Yb mm: 42.5...52.5

Remarks:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 01.07.92  
replaces : 18.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2050R318  
Type number : 0 460 404 059

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8144.97.2200

Power KW: 83

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 600  
Charge press. hPa: 800  
Setting value mm: 1.10...1.50

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 600  
Charge press hPa: 800  
Setting value bar: 3.40...4.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1950  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 56.00...57.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 42.50...43.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 12.50...16.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 2475  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 14.00...20.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 55.00...85.00  
mind 1000S.: 55.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 600  
 Inj.-qty. cm<sup>3</sup>/  
 difference 1000s.: 13.00...19.00#  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 600  
 TD-travel  
 difference mm: 0.60...0.80#  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 600  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30'  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
 Charge press hPa: 800  
 TD travel mm: 1.10...1.50  
 mm: (0.80...1.80)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press hPa: 800  
 TD travel mm: 4.20...5.00  
 mm: (3.90...5.30)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press hPa: 800  
 TD travel mm: 8.70...9.50  
 mm: (8.40...9.80)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 2300  
 Charge press hPa: 800  
 TD travel mm: 10.00...10.80  
 mm: (10.00...10.80)  
 Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 3.40...4.00  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press. hPa: 800

Supply-pump  
 pressure bar: 5.20...5.80  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 7.20...7.80  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.30  
 quantity cm<sup>3</sup>/10s: (41.70...83.30)  
 2nd speed 1/min: 2050  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 600\*  
 Charge-air pressure-setting  
 point hPa: 290  
 LDA-stroke mm: 5.3  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.00...54.00  
 1000s.: (51.00...56.00)  
 2nd speed 1/min: 2550  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
 1000s.: -  
 3rd speed 1/min: 2475  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 14.00...20.00  
 1000s.: (11.00...23.00)  
 4th speed 1/min: 2350  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 31.00...39.00  
 1000s.: -  
 5th speed 1/min: 2050  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 54.00...57.00  
 1000s.: (53.30...57.70)

6th speed 1/min: 1950  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.00...57.00  
 1000S.: (54.50...58.50)  
 7th speed 1/min: 1200  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 62.50...65.50  
 1000S.: -  
 8th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.50...43.50  
 1000S.: (40.50...45.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 12.50...16.50  
 1000S.: (10.50...18.50)

Dispersion cm<sup>3</sup>/: 3.0  
 1000S.: (3.0)

2nd speed 1/min: 500

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 5.50...10.50  
 1000S.: (5.50...10.50)

3rd speed 1/min: 700

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 2.00...5.00  
 1000S.: (2.00...5.00)

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1st speed 1/min: 600  
 Inj.-qty. cm<sup>3</sup>/: 13.00...19.00#  
 difference 1000S.: (13.00...19.00)

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 600  
 Inj.-qty. cm<sup>3</sup>/: 11.00...13.00'  
 difference 1000S.: (11.00...13.00)  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 600  
 TD-travel : 0.60...0.80#  
 difference mm: (0.60...0.80)  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 600  
 Supply pump-  
 pressure : 0.10...0.30'  
 difference bar: (0.10...0.30)  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...70.00  
 1000S.: (50.00...70.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...85.00  
 1000S.: (55.00...85.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

KF	mm: 5.6...6.0
MS	mm: 1.6...2.0
XK	mm: 20.0...22.0
XL	mm: 11.8...15.2
Ya	mm: 37.9...39.9
Yb	mm: 41.6...47.2

Remarks:

Overflow restriction 0.55 mm - Part No. ..303

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 03.07.92  
replaces : 17.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2050R361  
Type number : 0 460 404 064  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8144.97.2280

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000  
Charge press. hPa: 1000  
Setting value mm: 2.80...3.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000  
Charge press hPa: 1000  
Setting value bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 62.50...63.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 35.50...36.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.7  
1000S.: (2.7)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 3.00...7.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 21.00...27.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...90.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1000  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 14.50...20.50#  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1000  
Charge press hPa: 1000  
TD-travel  
difference mm: 0.60...0.80#  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1000  
Charge press hPa: 1000  
Supply pump  
pressure  
difference bar: 0.10...0.30\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2200  
Charge press hPa: 1000  
TD travel mm: 8.00...8.80  
mm: (7.70...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.80...3.20  
mm: (2.30...3.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.60...1.40  
mm: (0.30...1.70)

Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 2000  
Charge press. hPa: 1000  
TD travel mm: 7.40...8.20  
mm: (7.10...8.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600

Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.10...5.70  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.30...7.90  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm3/10s: (41.70...83.40)  
2nd speed 1/min: 2300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 4.8  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 52.50...53.50  
1000S.: (50.50...55.50)  
3rd speed 1/min: 2600  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...7.00  
1000S.: -  
5th speed 1/min: 2500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 21.00...27.00  
1000S.: (20.00...28.00)  
9th speed 1/min: 2300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12



Del. quantity cm3/: 53.50...56.50  
 1000S.: (52.80...57.20)  
 10th speed 1/min: 1950  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 56.50...1.50  
 1000S.: -  
 11th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 58.00...61.00  
 1000S.: -  
 12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 62.50...63.50  
 1000S.: (61.00...65.00)  
 18th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 35.50...36.50  
 1000S.: (33.50...38.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 9.00...13.00  
 1000S.: (8.00...14.00)  
 2nd speed 1/min: 475  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 3.00...9.00  
 1000S.: -

Residual:

1. Rotacao 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 3.00...7.00  
 1000S.: (2.00...8.00)  
 2nd speed 1/min: 650  
 Shutoff

FQ3

electromagnet Volt: 12  
 Del. quantity cm3/: 1.00...4.00  
 1000S.: -

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 12.00...14.00\*  
 difference 1000S.: (12.00...14.00)  
 Shutoff

electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 14.50...20.50#  
 difference 1000S.: (13.50...21.50)  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 TD-travel : 0.60...0.80#  
 difference mm: (0.60...0.80)  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1000  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.10...0.30\*  
 difference bar: (0.10...0.30)  
 Shutoff

electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 42.00...44.00  
 1000S.: (40.50...45.50)

Automatic starting fuel delivery:

1st speed 1/min: 200  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 65.00...95.00  
 1000S.: (65.00...95.00)

2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 30.00...40.00  
 1000S.: (30.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...90.00  
1000S.: (60.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

KF mm: 5.6...6.0  
MS mm: 1.6...2.0  
Ya mm: 33.0...35.0  
Yb mm: 49.7...55.3

Adjustment Potentiometer:

Angle for  
pot. °: - 12<-ARF  
Supply voltage  
pot. volt: 5.00  
Output volt  
pot. volt: 2.41

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN  
Edition : 07.07.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113

Injection pump : VE4/10F1350R418  
Type number : 0 460 404 069

Customer-specific information  
Customer : MAN

Engine : D 0824 GFD1

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 109

Opening  
Pressure bar: 207.00...210.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1000  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000  
Setting value bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 73.10...74.10

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000S.: 7.00...13.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

## Full-load speed regulation

Speed 1/min: 1370  
Del. quantity cm<sup>3</sup>/  
1000S.: 57.00...63.00

Shutoff  
electromagnet Volt: 24

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1300  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 800  
TD travel mm: 1.10...1.90  
mm: (0.80...2.20)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 3.10...3.70  
Shutoff  
electromagnet Volt: 24

2nd speed 1/min: 1000  
Supply-pump pressure bar: 5.20...5.80  
Shutoff  
electromagnet Volt: 24

3rd speed 1/min: 1300  
Supply-pump pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.30  
quantity cm<sup>3</sup>/10s: (41.70...83.30)

2nd speed 1/min: 1300  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1550  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1480  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)

4th speed 1/min: 1430  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000S.: (15.00...45.00)

5th speed 1/min: 1370  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 57.00...63.00  
1000S.: (55.50...64.50)

6th speed 1/min: 1300  
Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 73.10...76.10  
1000S.: (71.60...77.60)

7th speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.10...74.10  
1000S.: (71.10...76.10)

8th speed 1/min: 800  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 72.20...76.20  
1000S.: (70.70...77.70)

9th speed 1/min: 600  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 62.80...68.80  
1000S.: (61.80...69.80)

Mech. shutoff:  
Mech. Abstimmung:

1st speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 300  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 7.00...13.00  
1000S.: (5.00...15.00)

Dispersion cm<sup>3</sup>/: 6.0  
1000S.: (6.5)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...115.00  
1000S.: (65.00...115.00)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24

Del. quantity cm3/: 40.00...70.00  
1000S.: (40.00...70.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.6...6.0

MS mm: 1.0...1.4

SVS max. mm: 5.3

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 02.07.92  
replaces : 10.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F2000R342  
Type number : 0 460 414 067  
Customer Part-No. :

Customer-specific information  
Customer : SOFIM

Engine : 8140.07.2700

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery  
Prestroke mm: 0.3  
(from BDC): ±0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 525  
Del. quantity cm3/  
1000S.: 27.00...28.00

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 54.00...55.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.0)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2300  
Del. quantity cm3/  
1000S.: 18.00...22.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 16.50...24.50#  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1100

TD-travel  
difference mm: 0.40...0.60#  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1100  
Supply pump  
pressure  
difference bar: 0.10...0.30\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500  
TD travel mm: 4.10...4.90  
mm: (3.90...5.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
TD travel mm: 3.10...3.50  
mm: (2.70...3.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600  
TD travel mm: 0.60...1.40  
mm: (0.40...1.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump  
pressure bar: 4.10...4.70  
Shutoff

electromagnet Volt: 12  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5.70...6.30  
Shutoff

electromagnet Volt: 12  
3rd speed 1/min: 1500  
Supply-pump  
pressure bar: 6.90...7.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 525  
Shutoff  
electromagnet Volt: 12

F09

Overflow : 69.50...111.20  
quantity cm3/10s: (69.50...111.20)  
2nd speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Overflow : 83.40...180.70  
quantity cm3/10s: (83.40...180.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...5.00  
1000s.: (0.00...5.00)  
5th speed 1/min: 2300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 18.00...22.00  
1000s.: (15.50...24.50)

8th speed 1/min: 2200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 32.00...40.00  
1000s.: (30.00...42.00)

9th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 48.00...53.00 D  
1000s.: (47.00...54.00) D

10th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 53.20...58.20  
1000s.: (52.20...59.20)

12th speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 27.00...28.00 F  
1000s.: (24.00...31.00) F

18th speed 1/min: 1100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 54.00...55.00 E  
1000s.: (51.00...58.00) E

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350  
Del. quantity cm3/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12

Del. quantity cm3/: 10.50...14.50  
 1000S.: (8.50...16.50)  
 Dispersion cm3/: 3.0  
 1000S.: (3.5)  
 2nd speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...2.00  
 1000S.: (0.00...2.00)  
 3rd speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...5.00  
 1000S.: (0.00...5.00)  
 5th speed 1/min: 300  
 Del. quantity cm3/: 26.00...36.00  
 1000S.: (25.00...37.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1100  
 Inj.-qty. cm3/ : 13.30...15.30\*  
 difference 1000S.: (13.30...15.30)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Inj.-qty. cm3/: 16.50...24.50#  
 difference 1000S.: (16.50...24.50)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1100  
 Inj.-qty. cm3/: 2.00...8.00'  
 difference 1000S.: (2.00...8.00)  
 Shutoff  
 electromagnet Volt: 12

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1100  
 TD-travel : 0.40...0.60#  
 difference mm: (0.40...0.60)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 TD-travel : 0.00...0.80'  
 difference mm: (0.00...0.80)  
 Shutoff  
 electromagnet Volt: 12

SP press.-dif.measurement:  
 pompa di mandata (FP):  
 1st speed 1/min: 1100  
 Supply pump-  
 pressure : 0.10...0.30\*  
 difference bar: (0.10...0.30)  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...60.00  
 1000S.: (40.00...60.00)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 10.00...40.00  
 1000S.: (10.00...40.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...80.00  
 1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: -  
 KF mm: K-OT  
 MS mm: 0.8...1.2  
 SVS max. mm: 3.5  
 HBA stroke mm: 7.2  
 Ya mm: 36.9...40.9  
 Yb mm: 38.8...44.2

Remarks:  
 :  
 :



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : S0F  
Edition : 03.07.92  
replaces : 24.10.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R350  
Type number : 0 460 414 070  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-SOFIM

Engine : 8140.27.2780

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 2.20...2.60  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1750  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 55.00...56.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 16.50...17.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 325  
Del. quantity cm3/  
1000S.: 10.00...14.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 19.50...25.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...80.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1300  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 22.00...30.00'

Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1300  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 1.90...2.10'  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1300  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30\*  
 Shutoff  
 electromagnet Volt: 12

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

2nd speed 1/min: 1900  
 Charge press hPa: 1000  
 TD travel mm: 7.10...7.90  
 mm: (6.80...8.20)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 2.20...2.60  
 mm: (1.70...3.10)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 900  
 Charge press hPa: 1000  
 TD travel mm: 0.60...1.40  
 mm: (0.30...1.70)

Shutoff  
 electromagnet Volt: 12

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.60...6.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1900  
 Charge press. hPa: 1000

Supply-pump  
 pressure bar: 7.60...8.20  
 Shutoff  
 electromagnet Volt: 12

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)

#### Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
 Charge-air pressure-setting  
 point hPa: 400  
 LDA-stroke mm: 6.5  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.50...43.50  
 1000S.: (39.00...47.00)

2nd speed 1/min: 2350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 19.50...25.50  
 1000S.: (18.00...27.00)

8th speed 1/min: 2000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...48.00  
 1000S.: (38.00...50.00)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 51.00...56.00  
 1000S.: (50.00...57.00)

12th speed 1/min: 1750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynntity cm<sup>3</sup>/: 55.00...56.00  
 1000S.: (52.00...59.00)

15th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 52.50...57.50  
 1000S.: (51.00...59.00)  
 17th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 49.50...54.50  
 1000H.: (48.00...56.00)  
 18th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 16.50...17.50  
 1000S.: (13.50...20.50)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 47.00...56.00  
 1000S.: (46.00...57.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 325  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 325  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...14.00  
 1000S.: (8.00...16.00)

Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.5)

2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)  
 5th speed 1/min: 250  
 Del. quantity cm<sup>3</sup>/: 33.00...43.00  
 1000S.: (32.00...44.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 18.00...20.00\*  
 difference 1000S.: (18.00...20.00)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1300

Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 22.00...30.00'  
 difference 1000S.: (22.00...30.00)  
 Shutoff

electromagnet Volt: 12  
 5th speed 1/min: 1300  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 2.00...8.00#  
 difference 1000S.: (2.00...8.00)  
 Shutoff

electromagnet Volt: 12  
 2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 TD-travel : 1.90...2.10'  
 difference mm: (1.90...2.10)  
 Shutoff

electromagnet Volt: 12  
 4th speed 1/min: 1300  
 Charge press. hPa: 1000  
 TD-travel : 2.00...2.80#  
 difference mm: (2.00...2.80)

2nd speed 1/min: 1300  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.10...0.30\*  
 difference bar: (0.10...0.30)  
 Shutoff  
 electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
 terza fermo della portata  
 stop (EGR set)  
 scarico) (ARF)  
 gaz d'échappement-ARF)  
 Spacing mm: 12.0

1st speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 6.10...7.10  
 1000S.: (3.10...10.10)

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...80.00  
 1000S.: (50.00...80.00)

2nd speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 20.00...50.00  
 1000S.: (20.00...50.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...80.00  
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.2...3.4
KF	mm: K-OT
MS	mm: 0.6...1.0
SVS max.	mm: 0.8
Ya	mm: 32.0...36.0
Yb	mm: 42.9...47.1

Remarks:

;  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF  
Edition : 03.07.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/11F1900R393  
Type number : 0 460 414 078  
Customer Part-No. :

Customer-specific information  
Customer : SOFIM

Engine : 8140.47.2700

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1800  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 60.50...61.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 24.50...25.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 11.00...15.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.0  
1000S.: (6.5)

Full-load speed regulation

Speed 1/min: 2100  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 40.00...46.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 25.50...33.50#

Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1100  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 0.70...0.90#  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1100  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30\*  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

3rd speed 1/min: 1100  
 Charge press hPa: 1000  
 TD travel mm: 1.40...1.80  
 mm: (0.90...2.30)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1900  
 Charge press. hPa: 1000  
 TD travel mm: 5.40...6.20  
 mm: (5.40...6.20)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1500  
 Charge press. hPa: 1000  
 TD travel mm: 3.20...4.00  
 mm: (2.90...4.30)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.60...6.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 8.00...8.60  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1500  
 Charge press. hPa: 1000

Supply-pump  
 pressure bar: 6.80...7.40  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 75.00...119.50  
 quantity cm3/10s: (75.00...119.50)  
 2nd speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 97.30...180.70  
 quantity cm3/10s: (97.30...180.70)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 6.0  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 49.00...50.00  
 1000S.: (45.50...53.50)

2nd speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...5.00  
 1000S.: (0.00...5.00)

3rd speed 1/min: 2200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 19.00...27.00  
 1000S.: (17.00...29.00)

5th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 40.00...46.00  
 1000S.: (38.50...47.50)

9th speed 1/min: 1900  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 57.50...63.50  
 1000S.: (57.00...64.00)

12th speed 1/min: 1800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynntity cm3/: 60.50...61.50  
 1000S.: (57.50...64.50)

15th speed 1/min: 1400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.00...61.00  
 1000S.: (54.50...62.50)  
 17th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm<sup>3</sup>/: 55.00...60.00  
 1000H.: (53.50...61.50)  
 18th speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 24.50...25.50  
 1000S.: (21.50...28.50)  
 20th speed 1/min: 550  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.50...65.50  
 1000S.: (55.50...66.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 11.00...15.00  
 1000S.: (9.00...17.00)  
 Dispersion cm<sup>3</sup>/: 6.0  
 1000S.: (6.5)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
 1000S.: (0.00...5.00)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 21.70...23.70\*  
 difference 1000S.: (21.70...23.70)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 25.50...33.50#  
 difference 1000S.: (25.50...33.50)

Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1100  
 Charge press. hPa: 1000  
 Inj.-qty. cm<sup>3</sup>/: 2.00...8.00'  
 difference 1000S.: (2.00...8.00)  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD-travel : 0.70...0.90#  
 difference mm: (0.70...0.90)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1100  
 Charge press. hPa: 1000  
 TD-travel : 0.40...1.20'  
 difference mm: (0.40...1.20)  
 2nd speed 1/min: 1100  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.10...0.30\*  
 difference bar: (0.10...0.30)  
 Shutoff  
 electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...80.00  
 1000S.: (40.00...80.00)

2nd speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 18.00...48.00  
 1000S.: (18.00...48.00)

4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...70.00  
 1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
 min voltage : 10.0  
 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
 K mm: 3.2...3.4  
 KF mm: K-OT  
 MS mm: 0.8...1.2  
 SVS max. mm: 3.0  
 LDA stroke mm: 6.0

XK	mm: 20.0...22.0
XL	mm: 13.1...16.5
Ya	mm: 36.2...40.9
Yb	mm: 42.5...47.9

Remarks:

:  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.75 mm - Part No.  
..343,..344



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VMA  
Edition : 08.07.92  
replaces : 10.07.89  
Calibrating oil : ISO-4113

Injection pump : VE6/11F1800L363  
Type number : 0 460 416 064  
Customer Part-No. :

Customer-specific information  
Customer : VM

Engine : HR694HJ/10

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 3.80...4.20

Supply-pump pressure

Speed 1/min: 1500

F19

Charge press hPa: 1000  
Setting value bar: 6.10...6.70

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 84.50...85.50  
Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm<sup>3</sup>/  
1000S.: 49.00...50.00

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000S.: 11.00...15.00  
Del. quantity cm<sup>3</sup>/: 3.5  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2000  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 52.00...58.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 55.00...95.00  
mind 1000S.: 55.00

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 20.00...28.00\*  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
TD-travel  
difference mm: 0.60...0.80\*  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1500  
Supply pump  
pressure  
difference bar: 0.20...0.40#

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 1800  
 Charge press hPa: 1000  
 TD travel mm: 4.90...5.70  
 mm: (4.60...6.00)  
 3rd speed 1/min: 1500  
 Charge press hPa: 1000  
 TD travel mm: 3.80...4.20  
 mm: (3.30...4.70)  
 4th speed 1/min: 1000  
 Charge press hPa: 1000  
 TD travel mm: 1.40...2.20  
 mm: (1.10...2.50)

# Supply-pump pressure characteristic:

1st speed 1/min: 1800  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 7.10...7.70  
 2nd speed 1/min: 1500  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.10...6.70  
 3rd speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.00...3.60

# Overflow quantity at overflow valve:

1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (41.70...83.40)  
 2nd speed 1/min: 1800  
 Charge press. hPa: 1000  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (55.60...139.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
 Charge-air pressure-setting point hPa: 400  
 LDA-stroke mm: 5.2  
 Del. quantity cm3/: 69.00...70.00  
 1000S.: (67.00...72.00)  
 3rd speed 1/min: 2130  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...8.00  
 1000S.: -  
 5th speed 1/min: 2000  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 52.00...58.00  
 1000S.: (51.00...59.00)  
 9th speed 1/min: 1800  
 Charge press. hPa: 1000

Del. quantity cm3/: 79.00...82.00  
 1000S.: (78.00...83.00)  
 12th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 84.50...85.50  
 1000S.: (83.00...87.00)  
 18th speed 1/min: 600  
 Del. quantity cm3/: 49.00...50.00  
 1000S.: (47.00...52.00)  
 20th speed 1/min: 600  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 86.00...90.00  
 1000S.: -

# Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1800  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

# Electr. shutoff:

1st speed 1/min: 400  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

# Idle delivery:

1st speed 1/min: 400  
 Del. quantity cm3/: 11.00...15.00  
 1000S.: (9.00...17.00)  
 Dispersion cm3/: 3.5  
 1000S.: (3.5)  
 2nd speed 1/min: 600  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 450  
 Del. quantity cm3/: 5.50...10.50  
 1000S.: (3.50...12.50)

# Load-dependent start of delivery: Inj.-qty.dif.measurement:

1st speed 1/min: 1500  
 Inj.-qty. cm3/ : 17.00...19.00#  
 difference 1000S.: (17.00...19.00)  
 3rd speed 1/min: 1500  
 Inj.-qty. cm3/: 20.00...28.00\*  
 difference 1000S.: (20.00...28.00)

TD-travel dif.measurement:  
 correttore anticipo iniezione (SV):  
 1st speed 1/min: 1500  
 TD-travel : 0.60...0.80\*  
 difference mm: (0.60...0.80)

SP press.-dif.measurement:

pompa di mandata (FP):

1st speed 1/min: 1500

Supply pump-

pressure : 0.20...0.40#

difference bar: (0.20...0.40)

Automatic starting fuel delivery:

1st speed 1/min: 300

Del. quantity cm<sup>3</sup>/: 57.00...77.00

1000S.: (57.00...77.00)

2nd speed 1/min: 400

Del. quantity cm<sup>3</sup>/: 45.00...55.00

1000S.: (45.00...55.00)

4th speed 1/min: 100

Del. quantity cm<sup>3</sup>/: 55.00...95.00

1000S.: (55.00...95.00)

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.6...6.0

MS mm: 0.8...1.2

XK mm: 20.0...22.0

XL mm: 9.7...13.1

Ya mm: 38.6...40.6

Yb mm: 50.4...62.2

Remarks:

:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No. ..303

Pushing electromagnet.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 02.06.92  
replaces : 18.01.89  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1350R330  
Type number : 0 460 424 050  
Customer Part-No. :

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8040.45.261 LKW,USA

Power KW: 75

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
Pressure bar: 172.00...175.00

Perforated-plate  
diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC): +0.02(0.04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 2.80...3.20

Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000  
Setting value bar: 6.40...7.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 109.50...110.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 66.50...67.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 22.00...26.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: (4.0)

Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 35.00...41.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 75.00...115.00  
mind 1000S.: 75.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
 Charge press hPa: 1000  
 Inj.-qty. cm3/  
 difference 1000S.: 10.00...18.00\*  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1200  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 1.40...1.60\*  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1200  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.00...0.40'  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1350  
 Charge press hPa: 1000  
 TD travel mm: 3.70...4.50  
 mm: (3.40...4.80)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 2.80...3.20  
 mm: (2.30...3.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1050  
 Charge press hPa: 1000  
 TD travel mm: 1.30...2.10  
 mm: (1.00...2.40)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 3.60...4.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.40...7.00

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.00...7.60  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (41.70...83.40)  
 2nd speed 1/min: 1320  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 500  
 Charge-air pressure-setting  
 point hPa: 350  
 LDA-stroke mm: 6.3  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 86.00...97.00  
 1000S.: (83.00...90.00)  
 3rd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 5th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 35.00...41.00  
 1000S.: (32.00...44.00)  
 9th speed 1/min: 1320  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 105.50...109.50  
 1000S.: (104.50...110.50)  
 12th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quyntity cm3/: 109.50...110.50  
 1000S.: (107.00...113.00)  
 18th speed 1/min: 500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.00...70.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...26.00  
1000S.: (19.00...29.00)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (4.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

2nd speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 5.00...7.00'  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 10.00...18.00\*  
difference 1000S.: (10.00...18.00)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
TD-travel : 1.40...1.60\*  
difference mm: (1.40...1.60)

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Charge press. hPa: 1000

Supply pump-  
pressure : 0.00...0.40'  
difference bar: -  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 80.00...120.00  
1000S.: (80.00...120.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.50...37.50  
1000S.: (22.50...37.50)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 75.00...115.00  
1000S.: (75.00...115.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation	
K	mm: -
KF	mm: 5.3...5.7
MS	mm: 0.8...1.0
LDA stroke	mm: 6.3
XK	mm: 20.0...22.0
XL	mm: 15.0...18.4
Ya	mm: 37.9...39.9
Yb	mm: 45.0...50.2

Remarks:

:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS  
Edition : 08.07.92  
replaces : 09.10.91  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R370  
Type number : 0 460 424 056  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 4 TA 390

Power KW: 66

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.55  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

F25

## Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.20...3.60  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 4.30...4.90  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 86.50...87.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 10.00...16.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1155  
Del. quantity cm<sup>3</sup>/  
1000S.: 50.00...58.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 65.00...125.00  
mind 1000S.: 65.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 4.80...5.60  
mm: (4.50...5.90)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 TD travel mm: 3.20...3.60  
                     mm: (2.70...4.10)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 1.60...2.40  
                     mm: (1.30...2.70)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 3.20...3.80  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 4.30...4.90  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 5.80...6.40  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 41.70...83.40  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity cm<sup>3</sup>/10s: 55.60...139.00  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1215  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1170  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...60.00  
                     1000S.: (10.00...60.00)  
 5th speed 1/min: 1155  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 50.00...58.00  
                     1000S.: (46.00...62.00)  
 9th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 69.50...72.50  
                     1000S.: (63.00...74.00)  
 10th speed 1/min: 900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 76.50...79.50  
                     1000S.: (74.50...81.50)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 86.50...87.50  
                     1000S.: (84.00...90.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 86.50...94.50  
                     1000S.: (84.50...96.50)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Idle delivery:  
 1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 10.00...16.00  
                     1000S.: (8.00...18.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
                     1000S.: (7.0)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
                     1000S.: (0.00...4.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 85.00...135.00  
                     1000S.: (85.00...135.00)  
 2nd speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 70.00...100.00  
                     1000S.: (70.00...100.00)



4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 65.00...125.00  
1000s.: (65.00...125.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
SVS max.	mm: 1.1
XK	mm: 18.8...20.8
XL	mm: 11.0...14.4
Ya	mm: 34.8...38.8
Yb	mm: 41.2...46.8

Remarks:

: C.D.C. # 391 7934

Overflow restriction 0.55 mm - Part No.  
..303

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 07.07.92  
replaces : 19.06.90  
Calibrating oil : ISO-4113

Injection pump : VE4/12F1250R374  
Type number : 0 460 424 057  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 4 BTA 3.9 IND

Power KW: 88  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.55  
mm:  $\pm 0.02(0.06)$

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 850  
Charge press. hPa: 1000  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1000  
Setting value bar: 5.60...6.20  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 85.50...86.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 63.50...64.50  
Shutoff  
electromagnet Volt: 12

## Low-idle speed regulation

Speed 1/min: 365  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1310  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 61.00...67.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...140.00  
mind 1000S.: 70.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
Charge press hPa: 1000  
TD travel mm: 4.90...5.70  
mm: (4.60...6.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1000  
TD travel mm: 4.00...4.40  
mm: (3.50...4.90)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 1.80...2.60  
mm: (1.50...2.90)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.00...4.60

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 850  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.70...7.30

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 350  
LDA-stroke mm: 6.6  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 79.50...80.50  
1000s.: (76.00...84.00)

2nd speed 1/min: 1420  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

4th speed 1/min: 1350  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000s.: (15.00...55.00)

5th speed 1/min: 1310  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 61.00...67.00  
1000s.: (58.00...70.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 74.50...77.50  
1000s.: (73.00...79.00)

10th speed 1/min: 1100  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 77.00...80.00  
1000s.: (75.00...82.00)

12th speed 1/min: 850  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 85.50...86.50  
1000s.: (83.00...89.00)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 63.50...64.50  
1000s.: (60.00...68.00)

20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 89.00...99.00  
1000S.: -

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 365  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 365  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...140.00  
1000S.: (70.00...140.00)

2nd speed 1/min: 230  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 70.00...140.00  
1000S.: (70.00...140.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.0...1.4
SVS max.	mm: 2.4
LDA stroke	mm: 6.6
XK	mm: 21.8...23.8
XL	mm: 13.2...16.7
Ya	mm: 35.8...37.8
Yb	mm: 43.3...48.7

Remarks:

Operate control lever after each 6925 manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 01.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1350R329-1  
Type number : 0 460 426 120

Customer-specific information  
Customer : IVECO-FIAT

Engine : 8060.25.241

Power KW: 100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 683 901 020

Opening  
Pressure bar: 172...175

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1200  
Charge press hPa: 1000  
Setting value bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 96.00...97.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 5.0  
1000S.: (5.0)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 66.50...67.50  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 13.00...17.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.5  
1000S.: 4.0

Full-load speed regulation

Speed 1/min: 1500  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 37.00...43.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 75.00...115.00  
mind 1000S.: 75.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1200  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 12.00...20.00\*  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1200  
Charge press hPa: 1000

TD-travel  
 difference mm: 1.40...1.60\*  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1200  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.00...0.40#  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1350  
 Charge press hPa: 1000  
 TD travel mm: 3.60...4.40  
 mm: (3.30...4.70)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1200  
 Charge press hPa: 1000  
 TD travel mm: 3.00...3.40  
 mm: (2.50...3.90)  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 900  
 Charge press hPa: 1000  
 TD travel mm: 0.70...1.50  
 mm: (0.40...1.80)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 5.00...5.60  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 900  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.60...7.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1200  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 7.70...8.30  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1350  
 Charge press. hPa: 1000

Supply-pump  
 pressure bar: 8.30...8.90  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.30  
 quantity cm<sup>3</sup>/10s: (41.70...83.30)  
 2nd speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
 Charge-air pressure-setting  
 point hPa: 500  
 LDA-stroke mm: 3.0  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 81.00...82.00  
 1000S.: (78.50...84.50)  
 2nd speed 1/min: 1600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.00...43.00  
 1000S.: (34.00...46.00)  
 4th speed 1/min: 1350  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 92.50...95.50  
 1000S.: (91.00...97.00)  
 5th speed 1/min: 1200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 96.00...97.00  
 1000S.: (93.50...99.50)  
 6th speed 1/min: 800  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm3/: 90.50...93.50  
1000S.: (89.00...95.00)  
7th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 66.50...67.50  
1000S.: (64.00...70.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1350  
Charge press. hPa: 1000  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 13.00...17.00  
1000S.: (10.00...20.00)  
Dispersion cm3/: 3.5  
1000S.: (4.0)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm3/ : 12.00...20.00\*  
difference 1000S.: (12.00...20.00)  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1200  
Charge press. hPa: 1000  
Inj.-qty. cm3/: 5.00...7.00  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1200  
Charge press. hPa: 1000

TD-travel : 1.40...1.60#  
difference mm: (1.40...1.60)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1200  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.00...0.40#  
difference bar: (0.00...0.40)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 85.00...125.00  
1000S.: (85.00...120.00)

2nd speed 1/min: 250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 36.00...60.00  
1000S.: (36.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 75.00...115.00  
1000S.: (75.00...115.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

KF mm: 5.0...5.4  
LDA stroke mm: 3.0  
Ya mm: 37.9...39.9  
Yb mm: 43.5...49.1

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 17.05.89  
Calibrating oil : ISO-4113

Injection pump : VE6/12F125DR351  
Type number : 0 460 426 130  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA-590 A

Power KW: 135  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery block  
Piston stroke mm: 1.15  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 850

G06

Charge press. hPa: 1400  
Setting value mm: 2.20...2.60  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 850  
Charge press hPa: 1400  
Setting value bar: 6.10...6.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1400  
Del. quantity cm<sup>3</sup>/  
1000S.: 79.00...80.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 58.50...59.50

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 4.00...6.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1370  
Charge press hPa: 1400  
Del. quantity cm<sup>3</sup>/  
1000S.: 61.00...67.00

KSB/AFB  
valve Volt: 12



Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...150.00  
mind 1000S.: 70.00  
KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
Charge press hPa: 1400  
TD travel mm: 2.80...3.60  
mm: (2.50...3.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850  
Charge press hPa: 1400  
TD travel mm: 2.20...2.60  
mm: (1.70...3.10)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 700  
Charge press hPa: 1400  
TD travel mm: 0.80...1.60  
mm: (0.50...1.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 400\*  
TD travel mm: 3.00...4.00  
mm: (3.00...4.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 4.50...5.10  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

G07

2nd speed 1/min: 850  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 6.10...6.70  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press. hPa: 1400  
Supply-pump  
pressure bar: 7.70...8.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 745  
LDA-stroke mm: 6.6  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 76.00...77.00  
1000S.: (72.00...81.00)  
2nd speed 1/min: 1500  
Charge press. hPa: 1400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1470  
Charge press. hPa: 1400  
KSB/AFB  
valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...15.00  
                   1000S.: (0.00...15.00)  
 4th speed 1/min: 1420  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...55.00  
                   1000S.: (15.00...55.00)  
 5th speed 1/min: 1370  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 61.00...67.00  
                   1000S.: (58.00...70.00)  
 10th speed 1/min: 1100  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 77.00...83.00  
                   1000S.: (75.50...84.50)  
 11th speed 1/min: 850  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 79.50...86.50  
                   1000S.: (78.00...88.00)  
 12th speed 1/min: 1250  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 79.00...80.00  
                   1000S.: (76.50...82.50)  
 18th speed 1/min: 500  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.50...59.50  
                   1000S.: (54.50...63.50)  
 20th speed 1/min: 500  
 Charge press. hPa: 1400  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 91.50...105.50  
                   1000S.: -

Mech. shutoff:  
 Mech. Abstimmung:

1st speed 1/min: 1250  
 Charge press. hPa: 1400  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12  
 KSB/AFB  
 valve Volt: 12

Electr. shutoff:

1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                   1000S.: (0.00...3.00)

KSB/AFB  
 valve Volt: 12

Idle delivery:

1st speed 1/min: 375  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 4.00...6.00  
                   1000S.: (0.00...10.00)

Dispersion cm<sup>3</sup>/: 5.5  
                   1000S.: (7.0)

2nd speed 1/min: 400  
 KSB/AFB  
 valve Volt: 12

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
                   1000S.: (0.00...4.00)

3rd speed 1/min: 325  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 12.50...20.50  
                   1000S.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
 KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 80.00...160.00  
                   1000S.: (80.00...160.00)

2nd speed 1/min: 240  
 KSB/AFB  
 valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 70.00...150.00  
1000S.: (70.00...150.00)

Shutoff electromagnet:

Cut-in

min voltage : 12.0

Rated voltage : 10.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: -
MS	mm: 0.8...1.2
SVS max.	mm: 4.4
LDA stroke	mm: 6.6
Ya	mm: 34.8...38.8
Yb	mm: 44.0...49.2

Remarks:

: C.D.C. # 391 4928

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 12.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1400R367  
Type number : 0 460 426 137  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

G10

Speed 1/min: 850  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 850  
Setting value bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000S.: 56.50...57.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1450  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.00...43.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...110.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.40...6.20  
mm: (5.10...6.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 850

TD travel mm: 3.80...4.20  
mm: (3.30...4.70)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 500

TD travel mm: 0.70...1.50  
mm: (0.40...1.80)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump  
pressure bar: 2.50...3.10

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 850

Supply-pump  
pressure bar: 3.90...4.50

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1100

Supply-pump  
pressure bar: 4.90...5.50

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

2nd speed 1/min: 1400

Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1580

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1490

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1450

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (34.00...46.00)

9th speed 1/min: 1400

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 51.50...54.50  
1000S.: (50.00...56.00)

10th speed 1/min: 850

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 52.50...56.50  
1000S.: (50.50...58.50)

Shutoff  
electromagnet Volt: 12

12th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12

Del. quynity cm<sup>3</sup>/: 56.50...57.50  
1000S.: (54.00...60.00)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 42.00...50.00  
1000S.: (40.00...52.00)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1400

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 375

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 375

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 55.00...115.00  
1000S.: (55.00...115.00)

2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 25.00...65.00  
1000s.: (25.00...65.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.00...110.00  
1000s.: (50.00...110.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.3...1.7
XK	mm: 18.8...20.8
XL	mm: 9.6...13.0
Ya	mm: 34.8...38.8
Yb	mm: 39.3...44.7

Remarks:

: C.D.C. # 391 7542

:

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 08.07.92  
replaces : 23.10.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1000R369  
Type number : 0 460 426 138  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6BT- 5.9 IND.

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 850  
Del. quantity cm<sup>3</sup>/  
1000S.: 66.50...67.50

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 6.00...12.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1040  
Del. quantity cm<sup>3</sup>/  
1000S.: 53.00...59.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 4.60...5.40  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750

TD travel mm: 3.00...3.40  
mm: (2.50...3.90)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 500  
TD travel mm: 1.20...2.00  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 24

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2.30...2.90  
Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3.30...3.90  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1000  
Supply-pump  
pressure bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 24

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

#### Delivery-quant. and breakaway char.:

2nd speed 1/min: 1120  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 1060  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 25.00...55.00  
1000S.: (25.00...55.00)  
5th speed 1/min: 1040  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 53.00...59.00  
1000S.: (50.00...62.00)  
9th speed 1/min: 1000

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 63.50...66.50  
1000S.: (62.00...68.00)  
10th speed 1/min: 750

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 64.00...67.00  
1000S.: (62.00...69.00)  
12th speed 1/min: 850

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 66.50...67.50  
1000S.: (64.00...70.00)  
20th speed 1/min: 500

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.50...48.50  
1000S.: (38.50...50.50)

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

#### Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 6.00...12.00  
1000S.: (4.00...14.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

2nd speed 1/min: 240



Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 5.00...35.00

1000S.: (5.00...35.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 60.00...120.00

1000S.: (60.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.0...5.4

MS mm: 0.8...1.2

SVS max. mm: 1.2

XK mm: 18.8...20.8

XL mm: 9.9...13.3

Ya mm: 34.8...38.8

Yb mm: 38.3...43.7

Remarks:

: C.D.C. # 391 7563

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS  
Edition : 08.07.92  
replaces : 07.11.89  
Calibrating oil : ISO-4113

Injection pump : VE6/12F1100R371  
Type number : 0 460 426 140  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6 T 590

Power KW: 79

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02 (0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02 (0.06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 750  
Setting value mm: 2.60...3.00  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 61.50...62.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

## Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000S.: 41.00...47.00  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 45.00...95.00  
mind 1000S.: 45.00  
Shutoff  
electromagnet Volt: 12

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.00...5.80  
mm: (4.70...6.10)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 750  
 TD travel mm: 2.60...3.00  
 mm: (2.10...3.50)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 0.60...1.40  
 mm: (0.30...1.70)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 4.90...5.50  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 6.40...7.00  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1230  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 3rd speed 1/min: 1180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 15.00...45.00  
 1000s.: (15.00...45.00)  
 5th speed 1/min: 1160  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 41.00...47.00  
 1000s.: (38.00...50.00)  
 9th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 58.50...61.50  
 1000s.: (57.00...63.00)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 61.50...62.50  
 1000s.: (59.00...65.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 53.50...60.50  
 1000s.: (52.00...62.00)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 450  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000s.: (0.00...3.00)  
 Idle delivery:  
 1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...13.00  
 1000s.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000s.: (7.0)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000s.: (0.00...4.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 220  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.00...95.00  
 1000s.: (45.00...95.00)  
 2nd speed 1/min: 420  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 40.00...70.00  
 1000s.: (40.00...70.00)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 45.00...95.00  
 1000s.: (45.00...95.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: 5.0...5.4

MS mm: 0.8...1.2

SVS max. mm: 4.5

XK mm: 18.8...20.8

XL mm: 11.3...14.7

Ya mm: 34.8...38.8

Yb mm: 40.2...45.8

Remarks:

: C.D.C. # 391 7935

Overflow restriction 0.55 mm - Part No.

..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 12.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R372  
Type number : 0 460 426 141  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6BT-5.9 IND.

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.3  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.40...3.80  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm<sup>3</sup>/  
1000S.: 72.00...73.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 360  
Del. quantity cm<sup>3</sup>/  
1000S.: 8.00...14.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1300  
Del. quantity cm<sup>3</sup>/  
1000S.: 51.00...57.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 60.00...120.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.20...6.00  
mm: (4.90...6.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750

TD travel mm: 3.40...3.80  
mm: (2.90...4.30)

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 500

TD travel mm: 1.30...2.10  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump pressure bar: 2.40...3.00

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 750

Supply-pump pressure bar: 3.50...4.10

Shutoff  
electromagnet Volt: 12

3rd speed 1/min: 1100

Supply-pump pressure bar: 4.80...5.40

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

2nd speed 1/min: 1250

Shutoff  
electromagnet Volt: 12

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1390

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)

3rd speed 1/min: 1400

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

5th speed 1/min: 1300

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 51.00...57.00  
1000S.: (48.00...60.00)

8th speed 1/min: 1350

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

9th speed 1/min: 1250

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 68.50...71.50  
1000S.: (67.00...73.00)

10th speed 1/min: 900

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 74.50...78.50  
1000S.: (72.50...80.50)

11th speed 1/min: 750

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 75.00...79.00  
1000S.: -

12th speed 1/min: 1100

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 73.00...74.00  
1000S.: (70.50...76.50)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 64.00...72.00  
1000S.: (62.00...74.00)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1250

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 360

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 360

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 8.00...14.00  
1000S.: (6.00...16.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 450

Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 70.00...130.00  
1000s.: (70.00...130.00)

2nd speed 1/min: 240

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 30.00...70.00  
1000s.: (30.00...70.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 60.00...120.00  
1000s.: (60.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.6...1.0
XK	mm: 18.8...20.8
XL	mm: 11.1...14.5
Ya	mm: 34.8...38.8
Yb	mm: 41.0...46.6

Remarks:

: C.D.C. # 391 6947  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 23.10.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R373-3  
Type number : 0 460 426 149  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA-590

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.85  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

G22

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80

## Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 3.20...3.80

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 82.00...83.00  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000S.: 40.00...41.00

## Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000S.: 4.00...8.00  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

## Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000S.: 65.00...71.00

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
mind 1000S.: 70.00

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 1.40...1.80  
mm: (0.90...2.30)



4th speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2.10...2.70  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3.20...3.80  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4.30...4.90

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 450  
Del. quantity cm<sup>3</sup>/: 67.00...68.00  
1000s.: (63.00...72.00)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)  
3rd speed 1/min: 1330  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000s.: (15.00...55.00)  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 65.00...71.00  
1000s.: (62.00...74.00)  
9th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 73.50...76.50  
1000s.: (72.00...78.00)  
10th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 78.00...81.00  
1000s.: (76.50...82.50)  
12th speed 1/min: 750  
Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/: 82.00...83.00  
1000s.: (79.50...85.50)  
18th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 40.00...41.00  
1000s.: (36.00...45.00)  
20th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 82.00...90.00  
1000s.: -

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 4.00...8.00  
1000s.: (1.00...11.00)  
Dispersion cm<sup>3</sup>/: 5.5  
1000s.: (7.0)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000s.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 240  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000s.: (60.00...110.00)  
2nd speed 1/min: 420  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000s.: (20.00...60.00)  
4th speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000s.: (70.00...120.00)

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.2...1.6
SVS max.	mm: 2.2
Ya	mm: 34.8...38.8
Yb	mm: 42.7...48.1

Remarks:

: C.D.C. # 391 7038  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 23.10.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1250R373-4  
Type number : 0 460 426 150  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6 BTA-590

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.85  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

G24

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1.40...1.80  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 1000  
Setting value bar: 3.20...3.80  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000s.: 82.00...83.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm<sup>3</sup>/: 4.0  
1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000s.: 40.00...41.00

Shutoff  
electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000s.: 4.00...8.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 5.5  
1000s.: (7.0)

Full-load speed regulation

Speed 1/min: 1300  
Charge press hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000s.: 65.00...71.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
mind 1000s.: 70.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 1000  
TD travel mm: 2.30...3.10  
mm: (2.00...3.40)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750  
Charge press hPa: 1000  
TD travel mm: 1.40...1.80  
mm: (0.90...2.30)

Shutoff  
electromagnet Volt: 24  
4th speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 2.10...2.70

Shutoff  
electromagnet Volt: 24  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.20...3.80

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 450  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 67.00...68.00  
1000S.: (63.00...72.00)

2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1330  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1300  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 65.00...71.00  
1000S.: (62.00...74.00)

9th speed 1/min: 1250  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 73.50...76.50  
1000S.: (72.00...78.00)

10th speed 1/min: 1050  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 78.00...81.00  
1000S.: (76.50...82.50)

12th speed 1/min: 750  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quynity cm<sup>3</sup>/: 82.00...83.00  
1000S.: (79.50...85.50)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 40.00...41.00  
1000S.: (36.00...45.00)

20th speed 1/min: 500  
Charge press. hPa: 1000  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 82.00...90.00  
1000S.: -

Mech. shutoff:  
Mech. Abstellung:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 375  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 4.00...8.00  
1000S.: (1.00...11.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 0.00...4.00  
1000S.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 60.00...110.00  
1000S.: (60.00...110.00)

2nd speed 1/min: 420  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 20.00...60.00  
1000S.: (20.00...60.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm<sup>3</sup>/: 70.00...120.00  
1000S.: (70.00...120.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation  
K mm: -  
KF mm: 5.0...5.4

G26

MS mm: 1.2...1.6  
SVS max. mm: 2.2  
Ya mm: 34.8...38.8  
Yb mm: 42.7...48.1

Remarks:  
: C.D.C. # 391 7037  
:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 08.07.92  
replaces : 18.06.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R371-1  
Type number : 0 460 426 158  
Customer Part-No. :

Customer-specific information  
Customer : CASE

Engine : 6 T 590

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.2  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Setting value mm: 3.10...3.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/  
1000S.: 59.00...60.00  
Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm<sup>3</sup>/  
1000S.: 9.00...13.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1160  
Del. quantity cm<sup>3</sup>/  
1000S.: 37.00...43.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 65.00...105.00  
mind 1000S.: 65.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 5.40...6.20  
mm: (5.10...6.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750

TD travel mm: 3.10...3.50  
 mm: (2.60...4.00)  
 Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 500  
 TD travel mm: 1.00...1.80  
 mm: (0.70...2.10)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump  
 pressure bar: 3.80...4.40  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 750  
 Supply-pump  
 pressure bar: 4.90...5.50  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1100  
 Supply-pump  
 pressure bar: 6.40...7.00  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1230  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 1180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.00...33.00  
 1000S.: (13.00...33.00)  
 5th speed 1/min: 1160  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 37.00...43.00  
 1000S.: (34.00...46.00)  
 9th speed 1/min: 1100

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 56.50...59.50  
 1000S.: (55.00...61.00)  
 12th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 59.00...60.00  
 1000S.: (56.50...62.50)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 42.50...50.50  
 1000S.: (40.50...52.50)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 Idle delivery:  
 1st speed 1/min: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.00...13.00  
 1000S.: (6.00...16.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
 1000S.: (7.0)  
 2nd speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...4.00  
 1000S.: (0.00...4.00)  
 Automatic starting fuel delivery:  
 1st speed 1/min: 180  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.00...125.00  
 1000S.: (65.00...125.00)  
 2nd speed 1/min: 350  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 17.50...57.50  
 1000S.: (17.50...57.50)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 65.00...105.00  
 1000S.: (65.00...105.00)  
 Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
SVS max.	mm: 4.1
XK	mm: 18.8...20.8
XL	mm: 10.2...13.6
Ya	mm: 34.8...38.8
Yb	mm: 39.7...45.1

Remarks:

: C.D.C. # 391 8207

:

Overflow restriction 0.55 mm - Part No.  
..303

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 18.06.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1000R369-1  
Type number : 0 460 426 167  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6BT- 5.9 IND.

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.5  
mm:  $\pm 0.02(0.06)$

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

H02

Speed 1/min: 750  
Setting value mm: 3.50...3.90  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.60...4.20  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000S.: 73.00...74.00

Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 4.00...10.00

Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1045  
Del. quantity cm3/  
1000S.: 60.00...66.00

Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 70.00...130.00  
mind 1000S.: 70.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1000  
TD travel mm: 4.80...5.60  
mm: (4.50...5.90)

Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750



TD travel mm: 3.50...3.90  
mm: (3.00...4.40)

Shutoff  
electromagnet Volt: 24

4th speed 1/min: 500

TD travel mm: 1.40...2.20  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 24

Supply-pump pressure characteristic:

1st speed 1/min: 500

Supply-pump pressure bar: 2.60...3.20

Shutoff  
electromagnet Volt: 24

2nd speed 1/min: 750

Supply-pump pressure bar: 3.60...4.20

Shutoff  
electromagnet Volt: 24

3rd speed 1/min: 1000

Supply-pump pressure bar: 4.60...5.20

Shutoff  
electromagnet Volt: 24

Overflow quantity at overflow valve:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 24

Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

2nd speed 1/min: 1000

Shutoff  
electromagnet Volt: 24

Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 1170

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1100

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 25.00...45.00  
1000S.: (25.00...45.00)

5th speed 1/min: 1045

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 60.00...66.00  
1000S.: (57.00...69.00)

9th speed 1/min: 1000

H03

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 70.50...73.50  
1000S.: (69.00...75.00)

10th speed 1/min: 750

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 74.50...77.50  
1000S.: (72.50...79.50)

12th speed 1/min: 900

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 73.00...74.00  
1000S.: (70.50...76.50)

20th speed 1/min: 500

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 58.50...66.50  
1000S.: (56.50...68.50)

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1000

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Shutoff  
electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 500

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 500

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 4.00...10.00  
1000S.: (2.00...12.00)

Dispersion cm<sup>3</sup>/: 5.5  
1000S.: (7.0)

2nd speed 1/min: 540

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff  
electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 80.00...140.00  
1000S.: (80.00...140.00)

2nd speed 1/min: 250

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 30.00...60.00  
1000S.: (30.00...60.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm<sup>3</sup>/: 70.00...130.00  
1000S.: (70.00...130.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 0.8...1.2
S/S max.	mm: 1.2
XK	mm: 18.8...20.8
XL	mm: 9.9...13.3
Ya	mm: 34.8...38.8
Yb	mm: 35.7...41.3

Remarks:

: C.D.C. # 391 6972

Overflow restriction 0.55 mm - Part No.  
..303

Heavy-duty fuel-injection pump for  
DI-engines: only test using timing-  
device-travel measuring device with  
metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 06.07.92  
replaces : 28.03.90  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1050R373-6  
Type number : 0 460 426 172  
Customer Part-No. :

Customer-specific information  
Customer : CUMMINS

Engine : 6 BTA5.9

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 016

Opening  
Pressure bar: 147.00...150.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Start of delivery block  
Piston stroke mm: 1.6  
mm:  $\pm 0.02(0.06)$

Outlet : 0

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750  
Charge press. hPa: 750  
Setting value mm: 1.50...1.90  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750  
Charge press hPa: 750  
Setting value bar: 3.60...4.20  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000s.: 91.00...92.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm<sup>3</sup>/: 4.0  
1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000s.: 66.00...67.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/  
1000s.: 21.50...25.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.5  
1000s.: (6.0)

Full-load speed regulation

Speed 1/min: 1100  
Charge press hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000s.: 64.50...70.50

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 95.00...145.00  
mind 1000s.: 95.00

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1050  
Charge press hPa: 750  
TD travel mm: 2.60...3.40  
mm: (2.30...3.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...1.90  
mm: (1.00...2.40)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 500  
Charge press hPa: 750  
TD travel mm: 0.40...1.20  
mm: (0.10...1.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 2.50...3.10

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 3.60...4.20

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1050  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.90...5.50  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 1050  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

H06

1st speed 1/min: 600  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.2  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 82.50...83.50  
1000S.: (79.00...87.00)

2nd speed 1/min: 1170  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 1120  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...55.00  
1000S.: (15.00...55.00)

5th speed 1/min: 1100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 64.50...70.50  
1000S.: (61.50...73.50)

9th speed 1/min: 1050  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 78.50...81.50  
1000S.: (77.00...83.00)

12th speed 1/min: 750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 91.00...92.00  
1000S.: (88.50...94.50)

18th speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 66.00...67.00  
1000S.: (62.50...70.50)

20th speed 1/min: 500  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 100.00...108.00  
1000S.: -

Mech. shutoff:  
Mech. Abststellung:

1st speed 1/min: 1050  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Shutoff

electromagnet volt: 12

### Electr. shutoff:

1st speed 1/min: 375

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Idle delivery:

1st speed 1/min: 375

### Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 21.50...25.50  
1000S.: (18.50...28.50)

Dispersion cm<sup>3</sup>/: 3.5  
1000S.: (6.0)

2nd speed 1/min: 450

### Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Automatic starting fuel delivery:

1st speed 1/min: 130

### Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 100.00...150.00  
1000S.: (100.00...150.00)

2nd speed 1/min: 230

### Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (45.00...85.00)

4th speed 1/min: 100

### Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 95.00...145.00  
1000S.: (95.00...145.00)

### Shutoff electromagnet:

### Cut-in

min voltage : 10.0

Rated voltage : 12.0

### Mounting and assembly dimensions:

### Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.3...1.7
LDA stroke	mm: 6.2
Ya	mm: 34.8...38.8
Yb	mm: 44.2...49.8

### Remarks:

: C.D.C. # 391 7544

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM  
Edition : 07.07.92  
replaces : 29.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE6/12F1100R381-8  
Type number : 0 460 426 200  
Customer Part-No. :

Customer-specific information  
Customer : CDC

Engine : 6BT- 5.9 IND.

Power KW: 64  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
Pressure bar: 250.00...253.00

Perforated-plate  
diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery  
Prestroke mm: 0.3  
(from BDC):  $\pm 0.02(0.04)$

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 750

H08

Setting value mm: 3.30...3.70  
Shutoff  
electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 750  
Setting value bar: 3.50...4.10  
Shutoff  
electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 49.50...50.50  
Shutoff  
electromagnet Volt: 24  
Dispersion cm3/: 4.0  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 375  
Del. quantity cm3/  
1000S.: 17.00...23.00  
Shutoff  
electromagnet Volt: 24  
Del. quantity cm3/: 5.5  
1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1150  
Del. quantity cm3/  
1000S.: 33.50...39.50  
Shutoff  
electromagnet Volt: 24

Start:

Speed 1/min: 100  
Del. quantity cm3/: 50.00...90.00  
mind 1000S.: 50.00  
Shutoff  
electromagnet Volt: 24

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100  
TD travel mm: 6.10...6.90  
mm: (5.80...7.20)  
Shutoff  
electromagnet Volt: 24  
3rd speed 1/min: 750  
TD travel mm: 3.30...3.70  
mm: (2.80...4.20)

Shutoff  
 electromagnet Volt: 24  
 4th speed 1/min: 500  
 TD travel mm: 1.30...2.10  
                     mm: (1.00...2.40)  
 Shutoff  
 electromagnet Volt: 24  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 500  
 Supply-pump pressure bar: 2.40...3.00  
 Shutoff  
 electromagnet Volt: 24  
 2nd speed 1/min: 750  
 Supply-pump pressure bar: 3.50...4.10  
 Shutoff  
 electromagnet Volt: 24  
 3rd speed 1/min: 1100  
 Supply-pump pressure bar: 5.10...5.70  
 Shutoff  
 electromagnet Volt: 24  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 24  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 1200  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 3rd speed 1/min: 1160  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 15.00...45.00  
                     1000S.: (15.00...45.00)  
 5th speed 1/min: 1150  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 33.50...39.50  
                     1000S.: (30.50...42.50)  
 12th speed 1/min: 1100  
 Shutoff  
 electromagnet Volt: 24

H09

Del. quantity cm<sup>3</sup>/: 49.50...50.50  
                     1000S.: (47.00...53.00)  
 15th speed 1/min: 750  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 47.50...50.50  
                     1000S.: (45.50...52.50)  
 17th speed 1/min: 600  
 Shutoff  
 electromagnet volt: 24  
 Del. quantity cm<sup>3</sup>/: 43.50...49.50  
                     1000H.: (42.00...51.00)  
 20th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 32.50...40.50  
                     1000S.: (30.50...42.50)  
 Mech. shutoff:  
 Mech. Abstimmung:  
 1st speed 1/min: 1100  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Shutoff  
 electromagnet volt: 24  
 Electr. shutoff:  
 1st speed 1/min: 375  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Idle delivery:  
 1st speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 17.00...23.00  
                     1000S.: (15.00...25.00)  
 Dispersion cm<sup>3</sup>/: 5.5  
                     1000S.: (7.0)  
 2nd speed 1/min: 480  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                     1000S.: (0.00...3.00)  
 Automatic starting fuel delivery:  
 2nd speed 1/min: 375  
 Shutoff  
 electromagnet Volt: 24  
 Del. quantity cm<sup>3</sup>/: 20.00...40.00  
                     1000S.: (20.00...40.00)  
 4th speed 1/min: 100  
 Shutoff  
 electromagnet Volt: 24

Del. quantity cm3/: 50.00...90.00  
1000S.: (50.00...90.00)

Shutoff electromagnet:

Cut-in  
min voltage : 20.0  
Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K	mm: -
KF	mm: 5.0...5.4
MS	mm: 1.0...1.4
Ya	mm: 34.8...38.8
Yb	mm: 42.4...47.6

Remarks:

: C.D.C. # 392 2411  
:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU  
Edition : 30.06.92  
replaces : 26.07.88  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2150R316  
Type number : 0 460 484 019  
Customer Part-No. :

Customer-specific information  
Customer : PSA

Engine : XUD7TE

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 3.00...3.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 4.70...5.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 46.50...47.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 29.50...30.50

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2375  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 18.00...24.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (4.0)

Start:

Speed 1/min: 100  
Del. quantity cm3/: 45.00...85.00  
mind 1000S.: 45.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250

Charge press hPa: 1000  
 Inj.-qty. cm3/  
 difference 1000S.: 29.00...35.00\*  
 Shutoff  
 electromagnet Volt: 12  
 TD-travel dif.measurement  
 correttore anticipo iniezione (SV)  
 1.Speed 1/min: 1250  
 Charge press hPa: 1000  
 TD-travel  
 difference mm: 0.40...0.60\*  
 Shutoff  
 electromagnet Volt: 12  
 SP press.-dif.measurement  
 pompa di mandata (FP)  
 1.Speed 1/min: 1250  
 Charge press hPa: 1000  
 Supply pump  
 pressure  
 difference bar: 0.10...0.30#  
 Shutoff  
 electromagnet Volt: 12

Inspection-pump test specifications  
 Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
 Charge press hPa: 1000  
 TD travel mm: 5.90...6.70  
 mm: (5.60...7.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1250  
 Charge press hPa: 1000  
 TD travel mm: 3.00...3.40  
 mm: (2.70...3.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 750  
 Charge press hPa: 300  
 TD travel mm: 1.00...1.80  
 mm: (0.70...2.10)

Shutoff  
 electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
 Charge press. hPa: 300  
 Supply-pump  
 pressure bar: 3.50...4.10  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 4.70...5.30

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 1000  
 Supply-pump  
 pressure bar: 6.30...6.90  
 Shutoff  
 electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (41.70...83.40)  
 2nd speed 1/min: 2100  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 750  
 Charge-air pressure-setting  
 point hPa: 300  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 38.50...39.50  
 1000S.: (36.50...41.50)

3rd speed 1/min: 2525  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...6.00  
 1000S.: (0.00...6.00)

5th speed 1/min: 2375  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 18.00...24.00  
 1000S.: (17.00...25.00)

8th speed 1/min: 2275  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 33.00...39.00  
 1000S.: (32.00...40.00)

9th speed 1/min: 2100  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.00...47.00  
 1000S.: (43.70...48.30)

10th speed 1/min: 2000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm3/: 45.00...47.00  
 1000s.: (43.70...48.30)  
 11th speed 1/min: 1500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.00...47.00  
 1000s.: -  
 12th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 46.50...47.50  
 1000s.: (44.70...49.30)  
 15th speed 1/min: 1000  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 45.50...47.50  
 1000s.: (44.20...48.80)  
 17th speed 1/min: 750  
 Shutoff  
 electromagnet volt: 12  
 Del. quantity cm3/: 30.00...32.00  
 1000H.: (28.70...33.30)  
 18th speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 29.50...30.50  
 1000s.: (27.70...32.30)  
 20th speed 1/min: 500  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.50...45.50  
 1000s.: (42.20...46.80)

Mech. shutoff:  
 Mech. Abststellung:

1st speed 1/min: 2100  
 Charge press. hPa: 1000  
 Del. quantity cm3/: 0.00...3.00  
 1000s.: (0.00...3.00)

Shutoff  
 electromagnet volt: 12

Electr. shutoff:

1st speed 1/min: 350  
 Del. quantity cm3/: 0.00...3.00  
 1000s.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
 solidale con carcassa:  
 Idle delivery:

1st speed 1/min: 350

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Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 8.50...12.50  
 1000s.: (6.50...14.50)  
 Dispersion cm3/: 2.6  
 1000s.: (3.0)

High Idle:

1st speed 1/mi: 450  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 8.00...12.00  
 1000s.: (6.00...14.00)  
 Dispersion cm3/: 2.6  
 1000s.: (3.0)

Residual:

1.Rotacao 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 2.00...6.00  
 1000s.: (0.50...7.50)

Load-dependent start of delivery:  
 Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 29.00...35.00\*  
 difference 1000s.: (28.00...36.00)  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Inj.-qty. cm3/: 27.00...29.00#  
 difference 1000s.: (27.00...29.00)

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD-travel : 0.40...0.60\*  
 difference mm: (0.40...0.60)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1250  
 Charge press. hPa: 1000  
 TD-travel : 0.40...1.00'  
 difference mm: (0.40...1.00)

2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.10...0.30#  
 difference bar: (0.10...0.30)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply pump-  
 pressure : 0.60...1.00'  
 difference bar: (0.60...1.00)

Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (45.00...85.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (25.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...85.00  
1000S.: (44.00...84.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.2...1.6  
Ya mm: 19.7...21.7  
Yb mm: 76.0...88.0

Remarks:

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 02.07.92  
replaces : 01.02.89  
Calibrating oil : ISO-4113

Injection pump : VE4/8F2450L331  
Type number : 0 460 484 021  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1.3l Saugd., POLO

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 3.90...4.30  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 23.60...24.60

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 575  
Del. quantity cm3/  
1000S.: 2.50...3.50

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 32.00...82.00  
mind 1000S.: 32.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2200  
TD travel mm: 6.90...7.70  
mm: (6.60...8.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 3.90...4.30  
mm: (3.40...4.80)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1000  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump  
pressure bar: 3.70...4.30

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Supply-pump  
pressure bar: 5.40...6.00  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2450  
Supply-pump  
pressure bar: 7.70...8.30  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2850  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)  
3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...15.50  
1000S.: (4.50...16.50)  
5th speed 1/min: 2600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 13.00...17.00  
1000S.: (11.00...19.00)  
9th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 21.50...23.50  
1000S.: (20.30...24.70)  
10th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 14.50...19.50  
1000S.: (12.00...22.00)  
12th speed 1/min: 1500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.60...24.60  
1000S.: (21.90...26.30)  
20th speed 1/min: 800

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 18.50...21.50  
1000S.: (17.00...23.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.50...11.50  
1000S.: (6.50...14.50)  
2nd speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...8.50  
1000S.: (3.00...11.00)  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

Residual:

1. Rotacao 1/min: 575  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...3.50  
1000S.: (1.00...5.00)  
2nd speed 1/min: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 3.00...5.00  
1000S.: (1.50...6.50)

Automatic starting fuel delivery:

1st speed 1/min: 200  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.00...80.00  
1000S.: (30.00...80.00)  
2nd speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 10.00...30.00  
1000S.: (10.00...30.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.00...82.00  
1000s.: (32.00...82.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4

KF mm: -

MS mm: 1.2...1.6

Ya mm: 32.5...36.5

Yb mm: 53.9...64.5

Remarks:

⋮

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 03.07.92  
replaces : 11.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2400R349  
Type number : 0 460 484 028  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M709 BT 13.0

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 1000  
Setting value mm: 4.60...5.00  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500

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Charge press hPa: 1000  
Setting value bar: 5.70...6.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 39.70...40.70

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.0  
1000S.: (3.5)

Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000S.: 26.30...27.30

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

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Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 6.00...10.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2550  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 28.00...34.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 33.00...63.00  
mind 1000S.: 33.00

KSB/AFB  
Valve Volt: 12



Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1500  
Charge press hPa: 1000  
Inj.-qty. cm3/  
difference 1000S.: 19.00...25.00#  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1500  
Charge press hPa: 1000  
TD-travel  
difference mm: 0.90...1.10#  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 1500  
Charge press hPa: 1000  
Supply pump  
pressure  
difference bar: 0.10...0.30\*  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2400  
Charge press hPa: 1000  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 4.60...5.00  
mm: (4.10...5.50)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 1000

TD travel mm: 1.30...2.10  
mm: (0.80...2.60)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 2000  
Charge press. hPa: 1000  
TD travel mm: 6.90...7.50  
mm: (6.50...7.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 300  
Charge press. hPa: 1000  
TD travel mm: 2.30...4.70  
mm: (2.30...4.70)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2400  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.80...8.40  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 2000  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 6.80...7.40  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.70...6.30  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.90...4.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 2400  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 1100  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.0  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.50...34.50  
1000S.: (31.00...37.00)  
2nd speed 1/min: 2950  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)  
3rd speed 1/min: 2750  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...13.00  
1000S.: (4.00...14.00)  
5th speed 1/min: 2550  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 28.00...34.00  
1000S.: (25.00...37.00)  
9th speed 1/min: 2400  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.50...41.50  
1000S.: (37.50...42.50)  
12th speed 1/min: 1500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 39.70...40.70  
1000S.: (37.90...42.50)  
16th speed 1/min: 1100  
KSB solenoid-operated  
valve volt: 12  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 26.40...29.40  
1000H.: (24.90...30.90)  
18th speed 1/min: 750  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.30...27.30  
1000S.: (23.80...29.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

KSB/AFB  
valve Volt: 12

Idle delivery:

1st speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.00...10.00  
1000S.: (3.00...13.00)  
Dispersion cm<sup>3</sup>/: 3.0  
1000S.: (3.5)

2nd speed 1/min: 520  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

3rd speed 1/min: 350  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 14.50...19.50  
1000S.: -

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 18.00...20.00\*  
difference 1000S.: (18.00...20.00)

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

4th speed 1/min: 1500  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/: 19.00...25.00#  
difference 1000S.: (18.00...26.00)

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
TD-travel : 0.90...1.10#  
difference mm: (0.90...1.10)

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply pump-  
pressure : 0.10...0.30\*  
difference bar: (0.10...0.30)

KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 23.00...53.00  
1000S.: (23.00...53.00)

2nd speed 1/min: 450  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.00...63.00  
1000S.: (33.00...63.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.1...5.5  
MS mm: 1.3...1.7  
LDA stroke mm: 6.0  
Ya mm: 36.2...40.2  
Yb mm: 39.5...48.3

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
...303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 30.06.92  
replaces : 18.02.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R317-3  
Type number : 0 460 484 041  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : F8Q - 742

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

H22

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.00...32.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm3/  
1000S.: 22.00...28.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 9.00...13.00#  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.30...0.50#

Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)

1.Speed 1/min: 1250  
Supply pump  
pressure  
difference bar: 0.10...0.30\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.60...8.40  
mm: (7.30...8.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 4.10...4.50  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 500  
TD travel mm: 1.90...4.30  
mm: (1.90...4.30)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 310  
TD travel mm: 0.60...3.00  
mm: (0.60...3.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.50...5.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

H23

2nd speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...15.00  
1000S.: (6.00...16.00)

5th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000S.: (21.00...29.00)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...33.50  
1000S.: (30.20...34.80)

10th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.30...32.30  
1000S.: (29.00...33.60)

11th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.70...32.70  
1000S.: (28.90...33.50)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...32.00  
1000S.: (29.20...33.80)

20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.10...33.10  
1000S.: (29.30...33.90)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.50...10.50  
1000S.: (4.50...12.50)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...11.00  
1000S.: (5.00...13.00)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 1.00...5.00  
1000S.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/: 7.70...9.70\*  
difference 1000S.: (7.70...9.70)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm3/: 9.00...13.00#  
difference 1000S.: (9.00...13.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm3/: 2.00...8.00'  
difference 1000S.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.30...0.50#  
difference mm: (0.30...0.50)  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
3rd speed 1/min: 1250  
TD-travel : 0.20...0.60'  
difference mm: (0.10...0.70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:

H24

pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.10...0.30\*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.20...0.60'  
difference bar: (0.20...0.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...75.00  
1000S.: (45.00...75.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...45.00  
1000S.: (15.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.1...1.5  
SVS max. mm: 2.7  
Ya mm: 32.6...36.6  
Yb mm: 65.7...78.3

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 30.06.92  
replaces : 04.12.91  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/8F2300R317-5  
Type number : 0 460 484 044  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : F8Q - 732

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Setting value mm: 4.10...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Setting value bar: 4.50...5.10  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Del. quantity cm3/  
1000S.: 31.00...32.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 1.00...5.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2450  
Del. quantity cm3/  
1000S.: 22.00...28.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 9.00...13.00#  
Shutoff

electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250

TD-travel  
difference mm: 0.30...0.50#  
Shutoff

electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)

1.Speed 1/min: 1250  
Supply pump

pressure  
difference bar: 0.10...0.30\*

Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications

# Test specifications in parentheses

## Timing-device characteristic:

2nd speed 1/min: 2000  
TD travel mm: 7.60...8.40  
mm: (7.30...8.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD travel mm: 4.10...4.50  
mm: (3.60...5.00)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
TD travel mm: 1.60...2.40  
mm: (1.30...2.70)

Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 500  
TD travel mm: 1.90...4.30 B  
mm: (1.90...4.30)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 310  
TD travel mm: 0.60...3.00 A  
mm: (0.60...3.00)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure characteristic:

1st speed 1/min: 750  
Supply-pump  
pressure bar: 3.10...3.70

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Supply-pump  
pressure bar: 4.50...5.10

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Supply-pump  
pressure bar: 6.40...7.00

Shutoff  
electromagnet Volt: 12

## Overflow quantity at overflow valve:

1st speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)  
2nd speed 1/min: 2250

H26

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (55.60...139.00)

## Delivery-quant. and breakaway char.:

2nd speed 1/min: 2950  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000s.: (0.00...5.00)

3rd speed 1/min: 2650  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...15.00  
1000s.: (6.00...16.00)

5th speed 1/min: 2450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 22.00...28.00  
1000s.: (21.00...29.00)

9th speed 1/min: 2250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.50...33.50  
1000s.: (30.20...34.80)

10th speed 1/min: 2000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.30...32.30  
1000s.: (29.00...33.60)

11th speed 1/min: 1625  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 29.70...32.70  
1000s.: (28.90...33.50)

12th speed 1/min: 1250  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...32.00  
1000s.: (29.20...33.80)

20th speed 1/min: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 30.10...33.10  
1000s.: (29.30...33.90)

## Mech. shutoff:

## Electr. shutoff:

1st speed 1/min: 410  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000s.: (0.00...3.00)

## Damper set qty.:

## LFG-setting:



solidale con carcassa:  
Idle delivery:

1st speed 1/min: 410  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 6.50...10.50  
1000s.: (4.50...12.50)  
Dispersion cm<sup>3</sup>/: 2.5  
1000s.: (3.0)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...11.00  
1000s.: (5.00...13.00)

Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 1.00...5.00  
1000s.: (1.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 7.70...9.70\*  
difference 1000s.: (7.70...9.70)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 9.00...13.00#  
difference 1000s.: (9.00...13.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: 2.00...8.00'  
difference 1000s.: (2.00...8.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : 0.30...0.50#  
difference mm: (0.30...0.50)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : 0.20...0.60'  
difference mm: (0.10...0.70)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:

H27

pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : 0.10...0.30\*  
difference bar: (0.10...0.30)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : 0.20...0.60'  
difference bar: (0.20...0.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 210  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 45.00...75.00  
1000s.: (45.00...75.00)

2nd speed 1/min: 310  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 15.00...45.00  
1000s.: (15.00...45.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000s.: (40.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.2...3.4  
KF mm: 5.3...5.7  
MS mm: 1.1...1.5  
SVS max. mm: 1.8  
Ya mm: 32.6...36.6  
Yb mm: 65.7...78.3

Remarks:

A = KSB adjustment point  
B = KSB curve point

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet :  
Edition : 30.06.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2400R312  
Type number : 0 460 494 227  
Customer Part-No. :

Customer-specific information  
Customer : TOGLIATTI/SU

Engine : VAZ 341 LADA

Power KW: 40

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Setting value mm: 4.80...5.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Setting value bar: 4.80...5.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Del. quantity cm3/  
1000S.: 32.50...33.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 8.00...12.00  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Full-load speed regulation

Speed 1/min: 2600  
Del. quantity cm3/  
1000S.: 13.00...19.00  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...70.00  
mind 1000S.: 40.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2400  
TD travel mm: 9.10...9.90  
mm: (8.80...10.20)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1500  
TD travel mm: 4.80...5.20  
mm: (4.30...5.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 600

TD travel mm: 0.70...1.50  
 mm: (0.40...1.80)  
 Shutoff  
 electromagnet Volt: 12  
 5th speed 1/min: 1000  
 TD travel mm: 2.40...3.20  
 mm: (2.10...3.50)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 2400  
 Supply-pump pressure bar: 7.10...7.70  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Supply-pump pressure bar: 4.80...5.40  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 600  
 Supply-pump pressure bar: 2.60...3.20  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 1st speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 2400  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)  
 Delivery-quant. and breakaway char.:  
 2nd speed 1/min: 2900  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)  
 3rd speed 1/min: 2700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 4.50...11.50  
 1000S.: (3.00...13.00)  
 5th speed 1/min: 2600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.00...19.00  
 1000S.: (12.00...20.00)  
 9th speed 1/min: 2400

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.80...31.20  
 1000S.: (27.70...32.30)  
 10th speed 1/min: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 33.80...36.20  
 1000S.: (32.70...37.30)  
 12th speed 1/min: 1500  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.50...33.50  
 1000S.: (30.70...35.30)  
 20th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 28.50...31.50  
 1000S.: (27.00...33.00)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 425  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 8.00...12.00  
 1000S.: (5.00...15.00)  
 Dispersion cm<sup>3</sup>/: 2.5  
 1000S.: (2.5)  
 2nd speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.50...6.50  
 1000S.: (0.00...7.00)  
 4th speed 1/min: 650  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
 1000S.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 400  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 30.00...60.00  
 1000S.: (30.00...60.00)  
 2nd speed 1/min: 500  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 25.00...35.00  
1000S.: (25.00...35.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...70.00  
1000S.: (40.00...70.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4

KF mm: 5.6...6.0

MS mm: 1.2...1.6

SVS max. mm: 2.3

Ya mm: 38.7...40.7

Yb mm: 41.5...48.5

Remarks:

:  
:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 01.07.92  
replaces : 16.01.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2250R328  
Type number : 0 460 494 239  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 086-1.6L LLK

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3.80...4.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1500  
Charge press hPa: 750  
Setting value bar: 5.60...6.20

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 42.00...43.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 26.50...27.50

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 9.00...11.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 2.00...3.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2525  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 13.00...17.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 35.00...85.00  
mind 1000S.: 35.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 2250  
 Charge press hPa: 750  
 TD travel mm: 6.10...6.90  
 mm: (5.80...7.20)  
 electromagnet Volt: 12  
 2nd speed 1/min: 1800  
 Charge press hPa: 750  
 TD travel mm: 4.80...5.60  
 mm: (4.50...5.90)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1500  
 Charge press hPa: 750  
 TD travel mm: 3.80...4.20  
 mm: (3.30...4.70)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 750  
 TD travel mm: 1.80...2.60  
 mm: (1.50...2.90)

Shutoff  
 electromagnet Volt: 12

### Supply-pump pressure characteristic:

1st speed 1/min: 700  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 3.30...3.90  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1500  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 5.60...6.20  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2250  
 Charge press. hPa: 750  
 Supply-pump pressure bar: 7.70...8.30  
 Shutoff  
 electromagnet Volt: 12

### Overflow quantity at overflow valve:

1st speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (27.80...97.30)  
 2nd speed 1/min: 2250  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (41.70...152.90)

### Delivery-quant. and breakaway char.:

1nd speed 1/min: 900  
 Charge-air pressure-setting point hPa: 300  
 LDA-stroke mm: 5.5  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 32.50...33.50  
 1000S.: (30.00...36.00)

2nd speed 1/min: 2650  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...6.00  
 1000S.: (0.00...6.00)

5th speed 1/min: 2525  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 13.00...17.00  
 1000S.: (11.00...19.00)

8th speed 1/min: 2425  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.50...36.50  
 1000S.: (25.50...37.50)

9th speed 1/min: 2250  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 36.30...38.30  
 1000S.: (35.10...39.50)

12th speed 1/min: 1500  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>/: 42.00...43.00  
 1000S.: (40.30...44.70)

18th speed 1/min: 700  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 26.50...27.50  
 1000S.: (34.00...30.00)

20th speed 1/min: 700  
 Charge press. hPa: 750  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 34.00...37.00  
 1000S.: (32.50...38.50)

21th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 25.00...30.00  
 1000S.: (22.50...32.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (4.50...15.50)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)

High Idle:

1st speed 1/mi: 525  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...11.00  
1000S.: (5.00...15.00)

Residual:

1. Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...3.00  
1000S.: (-0.50...5.50)  
2nd speed 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.50...4.50  
1000S.: (0.00...7.00)

Automatic starting fuel delivery:

1st speed 1/min: 150  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

2nd speed 1/min: 350  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...37.00  
1000S.: (17.00...37.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 35.00...85.00  
1000S.: (35.00...85.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: K1
MS	mm: 1.1...1.5
XK	mm: 20.0...22.0
XL	mm: 9.9...13.3

Remarks:

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 02.07.92  
replaces : 19.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2100R343  
Type number : 0 460 494 246  
Customer Part-No. :

Customer-specific information  
Customer : FIAT-AUTO

Engine : M710 DT 19 D

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Charge press. hPa: 1000  
Setting value mm: 1.50...1.90  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Charge press hPa: 1000

Setting value bar: 3.20...3.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 52.00...53.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 40.00...41.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 11.00...15.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 4.00...6.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 30.00...36.00

KSB/AFB  
valve Volt: 12

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Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 55.00...85.00  
mind 1000S.: 55.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 800  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: 10.00...18.00\*

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 800

TD-travel  
difference mm: 0.70...0.90\*

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
SP press.-dif.measurement  
pompa di mandata (FP)  
1.Speed 1/min: 800  
Supply pump  
pressure  
difference bar: 0.10...0.30#  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 1000  
TD travel mm: 8.20...9.00  
mm: (7.90...9.30)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 1.50...1.90  
mm: (1.20...2.20)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
6th speed 1/min: 1500  
Charge press. hPa: 1000  
TD travel mm: 5.30...6.10  
mm: (5.00...6.40)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
8th speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 2.50...5.50  
mm: (2.50...5.50)

Shutoff  
electromagnet Volt: 12  
9th speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 3.20...4.80  
mm: (2.50...5.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.00...7.60

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.30...5.90

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.20...3.80

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow : 41.70...83.40  
quantity cm3/10s: (41.70...83.40)  
2nd speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1nd speed 1/min: 800  
Charge-air pressure-setting  
point hPa: 400  
LDA-stroke mm: 6.2  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 43.50...44.50  
1000S.: (41.50...46.50)  
2nd speed 1/min: 2450  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 12.00...20.00  
1000S.: (11.00...21.00)  
3rd speed 1/min: 2650  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...7.00  
1000S.: -  
5th speed 1/min: 2300  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 30.00...36.00  
1000S.: (29.00...37.00)  
9th speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 50.50...53.50  
1000S.: (49.50...54.50)  
10th speed 1/min: 800  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 55.50...58.50  
1000S.: -  
12th speed 1/min: 1500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 52.00...53.00  
1000S.: (50.50...54.50)  
18th speed 1/min: 600  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...41.00  
1000S.: (38.00...43.00)  
20th speed 1/min: 800  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...39.00  
1000S.: (35.50...40.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)  
KSB/AFB  
valve Volt: 12

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 11.00...15.00  
1000S.: (9.50...16.50)

Residual:

1.Rotacao 1/min: 700  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 4.00...6.00  
1000S.: (3.00...7.00)

2nd speed 1/min: 500

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 6.50...9.50

1000S.: -

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1st speed 1/min: 800

Inj.-qty. cm<sup>3</sup>/: 8.00...10.00#

difference 1000S.: -

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 800

Inj.-qty. cm<sup>3</sup>/: 10.00...18.00\*

difference 1000S.: (10.00...18.00)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

TD-travel dif.measurement:

correttore anticipo iniezione (SV):

1st speed 1/min: 800

TD-travel : 0.70...0.90\*

difference mm: (0.70...0.90)

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

SP press.-dif.measurement:

pompa di mandata (FP):

1st speed 1/min: 800

Supply pump-

pressure : 0.10...0.30#

difference bar: -

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 57.00...83.00

1000S.: (57.00...83.00)

2nd speed 1/min: 300

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 37.50...52.50

1000S.: (37.50...52.50)

4th speed 1/min: 100

KSB/AFB

valve Volt: 12

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 55.00...85.00

1000S.: (55.00...85.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4

KF mm: 5.6...6.0

MS mm: 1.0...1.4

Ya mm: 37.2...39.2

Yb mm: 37.5...43.5

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Adjustment of potentiometer at control lever

Prerequisite: pump set

Speed-control lever in idle position

Apply d.c. voltage 3.5...3.9 V to connection 1 (positive) and connection 3 (ground).

Turn potentiometer until a voltage of 3.07...3.13 V is indicated between connection 2 (positive) and connection 3 (ground).

If potentiometer is set correctly, the voltage must drop to 1.0...1.4 V in max. control lever position.

\* Unscrew KSB ball valve 2 mm

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 02.07.92  
replaces : 10.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200R345  
Type number : 0 460 494 248  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 742

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 5.10...5.70

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 47.00...48.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 37.00...38.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 5.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 23.00...29.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...100.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 2000  
 Charge press hPa: 800  
 TD travel mm: 6.20...7.00  
 mm: (6.20...7.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press hPa: 800  
 TD travel mm: 4.00...4.40  
 mm: (3.50...4.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 800  
 TD travel mm: 1.90...2.70  
 mm: (1.60...3.00)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1800  
 Charge press. hPa: 800  
 TD travel mm: 5.70...6.50  
 mm: (5.40...6.80)

Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 400  
 Charge press. hPa: 800  
 TD travel mm: 1.20...3.60  
 mm: (1.20...3.60)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 2.60...3.20

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 5.10...5.70

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 6.90...7.50

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600

Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm<sup>3</sup>/10s: (41.70...83.40)  
 2nd speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm<sup>3</sup>/10s: (55.60...139.00)

# Delivery-quant. and breakaway char.:

1nd speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 200  
 LDA-stroke mm: 5.5

Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 41.00...42.00  
 1000S.: (38.50...44.50)

3rd speed 1/min: 2500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 2.50...17.50  
 1000S.: (2.50...17.50)

5th speed 1/min: 2400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 23.00...29.00  
 1000S.: (22.00...30.00)

8th speed 1/min: 2700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 0.00...3.00  
 1000S.: (0.00...3.00)

9th speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 43.40...45.40  
 1000S.: (42.10...46.70)

12th speed 1/min: 1400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm<sup>3</sup>: 47.00...48.00  
 1000S.: (45.20...49.80)

18th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>: 37.00...38.00  
 1000S.: (34.50...40.50)

20th speed 1/min: 1000  
 Charge press. hPa: 800

### Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.90...47.90  
1000S.: (43.40...49.40)

### Mech. shutoff:

### Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

### Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...9.00  
1000S.: (3.00...11.00)

### High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...9.50  
1000S.: (3.50...11.50)

### Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...6.00  
1000S.: (2.00...6.00)

### Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...100.00  
1000S.: (40.00...100.00)

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
1000S.: (60.00...100.00)

### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

### Mounting and assembly dimensions:

### Designation

K	mm: 3.2...3.4
KF	mm: 5.6...6.0
MS	mm: 1.3...1.7
SVS max.	mm: 3.6
Ya	mm: 38.8...42.8
Yb	mm: 36.5...45.9

Operate control lever after each  
manifold-pressure compensator pressure  
change. :

\* Correction at adjusting nut (46)

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : REN  
Edition : 02.07.92  
replaces : 10.05.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2200R345-1  
Type number : 0 460 494 249  
Customer Part-No. :

Customer-specific information  
Customer : RNUR

Engine : J8S - 742

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130.00...133.00

Test inj. tubing : motornah

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1400  
Charge press. hPa: 800  
Setting value mm: 4.00...4.40  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1400  
Charge press hPa: 800  
Setting value bar: 5.10...5.70

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400  
Charge press. hPa: 800  
Del. quantity cm3/  
1000S.: 47.00...48.00

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 37.00...38.00

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 5.00...9.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500  
Del. quantity cm3/  
1000S.: 2.00...6.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400  
Charge press hPa: 800  
Del. quantity cm3/  
1000S.: 23.00...29.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 60.00...100.00  
mind 1000S.: 60.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

# Timing-device characteristic:

2nd speed 1/min: 2000  
 Charge press hPa: 800  
 TD travel mm: 6.20...7.00  
 mm: (6.20...7.00)

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 1400  
 Charge press hPa: 800  
 TD travel mm: 4.00...4.40  
 mm: (3.50...4.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 1000  
 Charge press hPa: 800  
 TD travel mm: 1.90...2.70  
 mm: (1.60...3.00)

Shutoff  
 electromagnet Volt: 12  
 6th speed 1/min: 1800  
 Charge press. hPa: 800  
 TD travel mm: 5.70...6.50  
 mm: (5.40...6.80)

Shutoff  
 electromagnet Volt: 12  
 9th speed 1/min: 400  
 Charge press. hPa: 800  
 TD travel mm: 1.20...3.60  
 mm: (1.20...3.60)

KSB/AFB  
 valve Volt: 12  
 Shutoff  
 electromagnet Volt: 12

# Supply-pump pressure characteristic:

1st speed 1/min: 600  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 2.60...3.20

Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1400  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 5.10...5.70

Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2000  
 Charge press. hPa: 800  
 Supply-pump  
 pressure bar: 6.90...7.50

Shutoff  
 electromagnet Volt: 12

# Overflow quantity at overflow valve:

1st speed 1/min: 600

Shutoff  
 electromagnet Volt: 12  
 Overflow : 41.70...83.40  
 quantity cm3/10s: (41.70...83.40)  
 2nd speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 55.60...139.00  
 quantity cm3/10s: (55.60...139.00)

# Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
 Charge-air pressure-setting  
 point hPa: 200  
 LDA-stroke mm: 5.5  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 41.00...42.00  
 1000S.: (38.50...44.50)

3rd speed 1/min: 2500  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 2.50...17.50  
 1000S.: (2.50...17.50)

5th speed 1/min: 2400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 23.00...29.00  
 1000S.: (22.00...30.00)

8th speed 1/min: 2700  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 0.00...3.00  
 1000S.: (0.00...3.00)

9th speed 1/min: 2000  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 43.40...45.40  
 1000S.: (42.10...46.70)

12th speed 1/min: 1400  
 Charge press. hPa: 800  
 Shutoff  
 electromagnet Volt: 12  
 Del. quynity cm3/: 47.00...48.00  
 1000S.: (45.20...49.80)

18th speed 1/min: 600  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm3/: 37.00...38.00  
 1000S.: (34.50...40.50)

20th speed 1/min: 1000  
 Charge press. hPa: 800



#### Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.90...47.90  
1000S.: (43.40...49.40)

#### Mech. shutoff:

#### Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

#### Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.00...9.00  
1000S.: (3.00...11.00)

#### High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 5.50...9.50  
1000S.: (3.50...11.50)

#### Residual:

1. Rotacao 1/min: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 2.00...6.00  
1000S.: (2.00...6.00)

#### Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.00...100.00  
1000S.: (40.00...100.00)

2nd speed 1/min: 300  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 20.00...40.00  
1000S.: (20.00...40.00)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 60.00...100.00  
1000S.: (60.00...100.00)

#### Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

#### Mounting and assembly dimensions:

#### Designation

K	mm: 3.2...3.4
KF	mm: 5.6...6.0
MS	mm: 1.3...1.7
SVS max.	mm: 3.6
LDA stroke	mm: 5.5
Ya	mm: 38.8...42.8
Yb	mm: 36.5...45.9

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

On initial measurement, screw in  
residual-quantity adjusting screw 1 mm.

Screw out residual-quantity adjusting  
screw 1 mm after setting pump.

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA  
Edition : 07.07.92  
replaces : 10.12.91  
Calibrating oil : ISO-4113

Injection pump : VE4/9F2100R410  
Type number : 0 460 494 272

Customer-specific information  
Customer : FIAT-AUTO

Engine : M710

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Start of delivery

Indicator setting  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 800  
Charge press. hPa: 1000  
Setting value mm: 1.80...2.20  
AFB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 800  
Charge press hPa: 1000  
Setting value bar: 3.20...3.80  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 46.00...47.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 33.50...34.50  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 400  
Del. quantity cm3/  
1000S.: 15.00...19.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (2.5)

Residual-Delivery Setting

Speed 1/min: 700  
Del. quantity cm3/  
1000S.: 4.00...6.00  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2300  
Charge press hPa: 1000

Del. quantity cm<sup>3</sup>/  
1000S.: 30.00...36.00

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
mind 1000S.: 50.00

KSB/AFB  
Valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 800  
Inj.-qty. cm<sup>3</sup>/  
difference 1000S.: -10.00...18.00#

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 800  
TD-travel  
difference mm: -0.70...0.90#  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press hPa: 1000  
TD travel mm: 3.20...4.80 A  
mm: (2.50...5.50)

electromagnet Volt: 12  
2nd speed 1/min: 800  
Charge press hPa: 1000  
TD travel mm: 1.80...2.20  
mm: (1.50...2.50)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1000  
Charge press hPa: 1000  
TD travel mm: 2.50...5.50 B  
mm: (2.50...5.50)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 1500  
Charge press hPa: 1000  
TD travel mm: 5.80...6.60  
mm: (5.50...6.90)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 2100  
Charge press. hPa: 1000  
TD travel mm: 8.60...9.40  
mm: (8.30...9.70)

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 2100  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 7.00...7.60

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1500  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 5.30...5.90

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 800  
Charge press. hPa: 1000  
Supply-pump  
pressure bar: 3.20...3.80

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 800  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (41.70...83.40)

2nd speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm3/10s: (55.60...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 900  
Charge-air pressure-setting  
point hPa: 450  
LDA-stroke mm: 6.6  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 40.00...41.00  
1000S.: (38.00...43.00)

2nd speed 1/min: 2650  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 0.00...7.00  
1000S.: -

3rd speed 1/min: 2450  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 12.00...20.00  
1000S.: (11.00...21.00)

4th speed 1/min: 2300  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 30.00...36.00  
1000S.: (29.00...37.00)

5th speed 1/min: 2100  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 45.00...48.00  
1000S.: (44.00...49.00)

6th speed 1/min: 1500  
Charge press. hPa: 1000  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 46.00...47.00  
1000S.: (44.50...48.50)

7th speed 1/min: 800  
Charge press. hPa: 1000

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 46.00...49.00  
1000S.: -

8th speed 1/min: 800

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 32.00...34.00  
1000S.: -

9th speed 1/min: 600

KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 33.50...34.50  
1000S.: (31.50...36.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 400  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

KSB/AFB  
valve Volt: 12

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 400  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 15.00...19.00  
1000S.: (13.50...20.50)

Dispersion cm3/: 2.5  
1000S.: (2.5)

2nd speed 1/min: 500  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 6.50...9.50  
1000S.: -

Residual:

1.Rotacao 1/min: 700  
KSB/AFB  
valve Volt: 12

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 4.00...6.00  
1000S.: (3.00...7.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 800  
Inj.-qty. cm<sup>3</sup>/: 8.00...10.00'  
difference 1000S.: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 800  
Inj.-qty. cm<sup>3</sup>/: 10.00...18.00#  
difference 1000S.: (10.00...18.00)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 800  
TD-travel : 0.70...0.90#  
difference mm: (0.70...0.90)  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 800  
Supply pump-  
pressure : 0.10...0.30'  
difference bar: -  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 220  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

2nd speed 1/min: 300  
KSB/AFB  
valve Volt: 12  
Shutoff  
electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.50...47.50  
1000S.: (32.50...47.50)

4th speed 1/min: 100  
KSB/AFB  
valve Volt: 12  
Shutoff

electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 50.00...80.00  
1000S.: (50.00...80.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 5.6...6.0  
KF mm: 3.2...3.4  
MS mm: 1.0...1.4  
LDA stroke mm: 6.6  
Ya mm: 37.2...39.2  
Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No.  
..303

A = KSB adjustment point  
B = KSB curve point

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VW  
Edition : 03.07.92  
replaces : -  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R433  
Type number : 0 460 494 286  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 L WK UD

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 4.30...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 49.30...50.30

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 16.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 7.00...8.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...43.00  
mind 1000S.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: -7.00...11.00\*  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1250  
TD-travel  
difference mm: -1.90...2.10\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 750  
TD travel mm: 8.00...8.60  
mm: (7.50...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 4.30...4.50  
mm: (3.60...5.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...2.10  
mm: (1.00...2.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.40...8.00  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2100

Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2600  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000S.: (7.00...15.00)

8th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...42.50  
1000S.: (31.50...43.50)

9th speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.90...42.90  
1000S.: (39.70...44.10)

12th speed 1/min: 1250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 49.30...50.30  
1000S.: (47.60...52.00)

16th speed 1/min: 600  
Charge press. hPa: -  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...40.50  
1000H.: (36.00...42.00)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.60...45.60  
1000S.: (41.90...46.30)

21th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (34.50...45.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Damper set qty.:

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 16.00...18.00  
1000S.: (13.00...21.00)  
Dispersion cm3/: 2.0  
1000S.: (3.0)

High Idle:

1st speed 1/mi: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 16.00...18.00  
1000S.: (13.00...21.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...8.00  
1000S.: (5.50...9.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : -4.50...6.50'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm3/: -7.0...11.0\*  
difference 1000S.: -(5.00...13.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm3/: +0.00...3.00#  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -1.90...2.10\*  
difference mm: -

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : -2.50...2.90#  
difference mm: -  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.10...0.30'  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : -1.00...1.40#  
difference bar: -(0.80...1.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 31.00...51.00  
1000S.: (31.00...51.00)

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...43.00  
1000S.: (32.50...47.50)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation  
K mm: 3.6...3.8  
KF mm: K-OT  
MS mm: 1.1...1.5  
Ya mm: 37.6...41.6  
Yb mm: 50.4...63.3

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 03.07.92  
Calibrating oil : ISO-4113

Injection pump : VE4/9F2300R479  
Type number : 0 460 494 321  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 UD f. B4

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 4.30...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000S.: 49.30...50.30

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000S.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000S.: 16.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000S.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000S.: 7.00...8.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 750  
Del. quantity cm3/  
1000S.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...43.00  
mind 1000S.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: -7.00...11.00#  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1250  
TD-travel  
difference mm: -1.90...2.10#  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 750  
TD travel mm: 8.00...8.60  
mm: (7.50...9.10)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 4.30...4.50  
mm: (3.60...5.20)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...2.10  
mm: (1.00...2.60)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2100

Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000s.: (0.00...6.00)

5th speed 1/min: 2600  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000s.: (7.00...15.00)

8th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...42.50  
1000s.: (31.50...43.50)

9th speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.90...42.90  
1000s.: (39.70...44.10)

12th speed 1/min: 1250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 49.30...50.30  
1000s.: (47.60...52.00)

16th speed 1/min: 600  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...40.50  
1000h.: (36.00...42.00)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.60...45.60  
1000s.: (41.10...47.10)

21th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000s.: (34.50...45.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm3/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

Damper set qty.:

2nd speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 17.00...19.00  
1000S.: (14.00...22.00)

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 16.00...18.00  
1000S.: (13.00...21.00)  
Dispersion cm3/: 2.0  
1000S.: (3.0)

High Idle:

1st speed 1/mi: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 16.00...18.00  
1000S.: (13.00...21.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 7.00...8.00  
1000S.: (5.50...9.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm3/ : -4.50...6.50\*  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Inj.-qty. cm3/: -7.0...11.0#  
difference 1000S.: -(5.00...13.00)  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm3/: +0.00...3.00'  
difference 1000S.: -

Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
TD-travel : -1.90...2.10#  
difference mm: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : -2.50...2.90'  
difference mm: -(2.10...3.30)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.10...0.30\*  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : -1.00...1.40'  
difference bar: -(0.80...1.60)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 27.00...29.00  
1000S.: (24.00...32.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 35.00...55.00  
1000S.: (35.00...55.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 31.00...51.00  
1000S.: (31.00...51.00)

3rd speed 1/min: 100

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 37.00...43.00  
1000s.: (32.50...47.50)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K	mm: 3.6...3.8
KF	mm: K-OT
MS	mm: 1.0...1.4
Ya	mm: 37.6...41.6
Yb	mm: 50.1...63.3

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303 :

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV  
Edition : 06.07.92  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/9F2300R479-4  
Type number : 0 460 494 322  
Customer Part-No. :

Customer-specific information  
Customer : VW

Engine : 1,9 UD f. B4/AU

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 750  
Setting value mm: 4.30...4.50  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 750  
Setting value bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 750  
Del. quantity cm3/  
1000s.: 49.30...50.30

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 2.5  
1000s.: (3.0)

Low-idle speed regulation

Speed 1/min: 450  
Del. quantity cm3/  
1000s.: 16.00...18.00

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.0  
1000s.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550  
Del. quantity cm3/  
1000s.: 7.00...8.00

Shutoff  
electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 750  
Del. quantity cm3/  
1000s.: 9.00...13.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 37.00...43.00  
mind 1000s.: 37.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000s.: -7.00...11.00\*

Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)

1.Speed 1/min: 1250  
TD-travel  
difference mm: -1.90...2.10\*  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 2100  
Charge press hPa: 750  
TD travel mm: 8.00...8.60  
mm: (7.60...9.00)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Charge press hPa: 750  
TD travel mm: 4.30...4.50  
mm: (3.70...5.10)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 750  
Charge press hPa: 750  
TD travel mm: 1.50...2.10  
mm: (1.10...2.50)

Shutoff  
electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 750  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 4.30...4.90

Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 5.40...6.00

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2100  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 7.40...8.00

Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet volt: 12  
Overflow : 41.70...83.40  
quantity cm<sup>3</sup>/10s: (27.80...97.30)  
2nd speed 1/min: 2100

Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Overflow : 55.60...139.00  
quantity cm<sup>3</sup>/10s: (41.70...152.90)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2750  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...6.00  
1000S.: (0.00...6.00)

5th speed 1/min: 2600  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 9.00...13.00  
1000S.: (7.00...15.00)

8th speed 1/min: 2400  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 32.50...42.50  
1000S.: (31.50...43.50)

9th speed 1/min: 2100  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 40.90...42.90  
1000S.: (39.70...44.10)

12th speed 1/min: 1250  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quynity cm<sup>3</sup>/: 49.30...50.30  
1000S.: (47.60...52.00)

16th speed 1/min: 600  
Shutoff  
electromagnet volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...40.50  
1000H.: (36.00...42.00)

20th speed 1/min: 700  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.60...45.60  
1000S.: (41.10...47.10)

21th speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (34.50...45.50)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

Damper set qty.:

2nd speed 1/min: 1000  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 17.00...19.00  
1000S.: (14.00...22.00)

LFG-setting:  
solidale con carcassa:  
Idle delivery:

1st speed 1/min: 450  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)  
Dispersion cm<sup>3</sup>/: 2.0  
1000S.: (3.0)

High Idle:

1st speed 1/mi: 500  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 16.00...18.00  
1000S.: (13.00...21.00)

Residual:

1.Rotacao 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 7.00...8.00  
1000S.: (5.50...9.50)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: -4.50...6.50'  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12  
5th speed 1/min: 1250  
Inj.-qty. cm<sup>3</sup>/: +0.00...3.00#  
difference 1000S.: -  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250

K03

TD-travel : -1.90...2.10\*  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
TD-travel : -2.50...2.90#  
difference mm: -(2.30...3.10)  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement:  
pompa di mandata (FP):  
1st speed 1/min: 1250  
Supply pump-  
pressure : -0.10...0.30'  
difference bar: -  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 1250  
Supply pump-  
pressure : -1.00...1.40#  
difference bar: -(0.80...1.60)  
Shutoff  
electromagnet Volt: 12

Part-load del.at 3rd inj.-qty.  
terza fermo della portata  
stop (EGR set)  
scarico) (ARF)  
gaz d'échappement-ARF)  
Spacing mm: 12.0

1st speed 1/min: 1000  
Charge press. hPa: 750  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 27.00...29.00  
1000S.: (24.00...32.00)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 35.00...55.00  
1000S.: (35.00...55.00)

2nd speed 1/min: 380  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 31.00...51.00  
1000S.: (31.00...51.00)

3rd speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.00...43.00  
1000S.: (32.50...47.50)

Shutoff electromagnet:

Cut-in  
min voltage : 12.0  
Rated voltage : 10.0

Mounting and assembly dimensions:

Designation

K	mm: 1.6...1.8
KF	mm: K-0T
MS	mm: 1.0...1.4
Ya	mm: 37.6...41.6
Yb	mm: 50.4...63.3

Remarks:

Overflow restriction 0.55 mm - Part No.  
..303



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 02.07.92  
Calibrating oil : ISO-4113

Injection pump : VE4/9F2500R341  
Type number : 9 460 620 003

Customer-specific information  
Customer : ISUZU

Engine : 4EC1-BADT

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 700  
Setting value mm: 2.80...3.20  
Shutoff  
electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 700  
Setting value bar: 3.80...4.40  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 700  
Del. quantity cm3/  
1000S.: 46.90...47.90

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: -  
1000S.: (2.5)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000S.: 33.80...37.80

Shutoff  
electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425  
Del. quantity cm3/  
1000S.: 8.50...12.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

Full-load speed regulation

Speed 1/min: 425  
Charge press hPa: 700  
Del. quantity cm3/  
1000S.: 19.60...25.60

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 38.00...70.00  
mind 1000S.: 38.00  
Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1250  
Charge press hPa: 700  
Inj.-qty. cm3/  
difference 1000S.: 16.00...24.00  
Shutoff  
electromagnet Volt: 12  
TD-travel dif.measurement  
correttore anticipo iniezione (SV)  
1.Speed 1/min: 1250  
Charge press hPa: 700

TD-travel  
difference mm: 1.40...1.60  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 620  
Charge press hPa: 700  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press hPa: 700  
TD travel mm: 2.80...3.20  
mm: (2.30...3.70)

Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press hPa: 700  
TD travel mm: 5.60...6.40  
mm: (5.30...6.70)

Shutoff  
electromagnet Volt: 12  
4th speed 1/min: 2250  
Charge press hPa: 700  
TD travel mm: 6.60...7.40  
mm: (6.30...7.70)

Supply-pump pressure characteristic:

1st speed 1/min: 620  
Charge press. hPa: 700  
Supply-pump  
pressure bar: 2.20...2.80  
Shutoff  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press. hPa: 700  
Supply-pump  
pressure bar: 2.80...4.40  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2250  
Charge press. hPa: 700  
Supply-pump  
pressure bar: 6.20...6.80  
Shutoff  
electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Overflow : 75.00...119.50  
quantity cm<sup>3</sup>/10s: (75.00...119.50)

2nd speed 1/min: 2500  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Overflow : 94.50...139.00  
quantity cm<sup>3</sup>/10s: (94.50...139.00)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 340  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 43.30...44.30  
1000S.: (41.30...46.30)

2nd speed 1/min: 2950  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...15.00  
1000S.: (0.00...15.00)

3rd speed 1/min: 2750  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 19.60...25.60  
1000S.: (18.60...26.60)

4th speed 1/min: 2600  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 26.10...34.10  
1000S.: (26.10...34.10)

5th speed 1/min: 2500  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.10...37.10  
1000S.: (33.30...37.90)

6th speed 1/min: 2300  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.50...47.50  
1000S.: (43.80...48.20)

7th speed 1/min: 2000  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.30...47.30  
1000S.: (43.80...47.80)

8th speed 1/min: 1500  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.90...47.90  
1000S.: (45.10...49.70)

9th speed 1/min: 1500

Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 34.60...38.60  
1000S.: (34.10...39.10)  
10th speed 1/min: 1300  
Charge press. hPa: 700  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 46.10...49.10  
1000S.: (45.60...49.60)  
11th speed 1/min: 600  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 33.80...37.80  
1000S.: (32.80...38.80)

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 425  
Del. quantity cm<sup>3</sup>/: 0.00...3.00  
1000S.: (0.00...3.00)

Idle delivery:

1st speed 1/min: 425  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 8.50...12.50  
1000S.: (6.50...14.50)  
Dispersion cm<sup>3</sup>/: 2.5  
1000S.: (3.0)  
2nd speed 1/min: 550  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 0.00...5.00  
1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: 700  
Inj.-qty. cm<sup>3</sup>/: 16.00...24.00  
difference 1000S.: (16.00...24.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: 700  
TD-travel : 1.40...1.60  
difference mm: (1.40...1.60)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 42.50...57.50  
1000S.: (42.50...57.50)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 38.00...70.00  
1000S.: (38.00...70.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Operate control lever after each  
manifold-pressure compensator pressure  
change.

\* Correction at adjusting nut (46)

Overflow restriction 0.75 mm - Part No.  
..343,..344

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : OPE  
Edition : 07.07.92  
replaces : 18.07.89  
Calibrating oil : ISO-4113  
  
Injection pump : VE4/10F2300R365  
Type number : 9 460 620 004

Customer-specific information  
Customer : ISUZU

Engine : 4 EE1-TC

## TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
Electronically : 42...50

Inlet press., bar : 0.35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
Pressure bar: 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00  
x Wall thickness : 2.00  
x Length mm: 450

Injection-pump setting values  
Test specifications in parentheses

## Timing-device travel

Speed 1/min: 1250  
Charge press. hPa: 1000  
Setting value mm: 2.90...3.30  
Shutoff  
electromagnet Volt: 12

## Supply-pump pressure

Speed 1/min: 1250  
Charge press hPa: 1000  
Setting value bar: 3.90...4.50  
Shutoff  
electromagnet Volt: 12

## Full-load del. with charge press.:

Speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000S.: 52.50...53.50  
Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: -  
1000S.: (2.5)

## Low-idle speed regulation

Speed 1/min: 415  
Del. quantity cm3/  
1000S.: 9.50...13.50  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 2.5  
1000S.: (3.0)

## Full-load speed regulation

Speed 1/min: 2600  
Charge press hPa: 1000  
Del. quantity cm3/  
1000S.: 18.40...24.40  
Shutoff  
electromagnet Volt: 12

## Start:

Speed 1/min: 100  
Del. quantity cm3/: 44.00...76.00  
mind 1000S.: 44.00  
Shutoff  
electromagnet Volt: 12

Inspection-pump test specifications  
Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 600  
Charge press hPa: 1000  
TD travel mm: 0.30...1.10  
mm: (0.00...1.40)  
electromagnet Volt: 12  
2nd speed 1/min: 1250  
Charge press hPa: 1000  
TD travel mm: 2.90...3.30  
mm: (2.40...3.80)  
Shutoff  
electromagnet Volt: 12  
3rd speed 1/min: 2000  
Charge press hPa: 1000  
TD travel mm: 5.80...6.60  
mm: (5.50...6.90)

Shutoff  
 electromagnet Volt: 12  
 4th speed 1/min: 2250  
 Charge press hPa: 1000  
 TD travel mm: 6.80...7.60  
                   mm: (6.50...7.90)  
 Shutoff  
 electromagnet Volt: 12  
 Supply-pump pressure characteristic:  
 1st speed 1/min: 600  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 2.10...2.70  
 Shutoff  
 electromagnet Volt: 12  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 3.90...4.50  
 Shutoff  
 electromagnet Volt: 12  
 3rd speed 1/min: 2250  
 Charge press. hPa: 1000  
 Supply-pump pressure bar: 6.50...7.10  
 Shutoff  
 electromagnet Volt: 12  
 Overflow quantity at overflow valve:  
 2nd speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Overflow : 83.40...127.80  
 quantity cm<sup>3</sup>/10s: (83.40...127.80)  
 Delivery-quant. and breakaway char.:  
 1st speed 1/min: 1000  
 Charge-air pressure-setting point hPa: 410  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 47.80...48.80  
                           1000S.: (45.80...50.80)  
 2nd speed 1/min: 2750  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
                           1000S.: (0.00...5.00)  
 3rd speed 1/min: 2600  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 18.40...24.40  
                           1000S.: (16.90...25.90)  
 4th speed 1/min: 2400  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 41.00...49.00  
                           1000S.: (40.00...50.00)  
 5th speed 1/min: 2300  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 49.50...52.50  
                           1000S.: (48.70...53.30)  
 6th speed 1/min: 2200  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 50.00...53.00  
                           1000S.: (49.20...53.80)  
 7th speed 1/min: 1250  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 31.70...35.70  
                           1000S.: (31.20...36.20)  
 8th speed 1/min: 1250  
 Charge press. hPa: 1000  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 52.50...53.50  
                           1000S.: (50.70...55.30)  
 9th speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 34.70...38.70  
                           1000S.: (33.70...39.70)  
 Mech. shutoff:  
 Electr. shutoff:  
 1st speed 1/min: 415  
 Del. quantity cm<sup>3</sup>/: 0.00...3.00  
                           1000S.: (0.00...3.00)  
 Idle delivery:  
 1st speed 1/min: 415  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 9.50...13.50  
                           1000S.: (7.50...15.50)  
 Dispersion cm<sup>3</sup>/: 2.5  
                           1000S.: (3.0)  
 2nd speed 1/min: 550  
 Shutoff  
 electromagnet Volt: 12  
 Del. quantity cm<sup>3</sup>/: 0.00...5.00  
                           1000S.: (0.00...5.00)

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

1st speed 1/min: 1250  
Charge press. hPa: 1000  
Inj.-qty. cm<sup>3</sup>/ : 16.00...24.00  
difference 1000s.: (16.00...24.00)  
Shutoff  
electromagnet Volt: 12

TD-travel dif.measurement:  
correttore anticipo iniezione (SV):  
1st speed 1/min: 1250  
Charge press. hPa: 1000  
TD-travel : 0.70...0.90  
difference mm: (0.60...1.00)  
Shutoff  
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 400  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 37.50...52.50  
1000s.: (37.50...52.50)

4th speed 1/min: 100  
Shutoff  
electromagnet Volt: 12  
Del. quantity cm<sup>3</sup>/: 44.00...76.00  
1000s.: (44.00...76.00)

Shutoff electromagnet:

Cut-in  
min voltage : 10.0  
Rated voltage : 12.0

Mounting and assembly dimensions:

MS mm: 0.8...1.0  
Overflow restriction 0.75 mm - Part No.  
...343,...344

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 466 099  
 Injection pump  
 Pump designation : PES6A75D410/3RS136G  
 EP type number : 0 410 476 976  
 Governor  
 Governor design. : RSV325...1150A8C494-4L  
 Governor no. : 0 420 232 572

Customer-spec. information  
 Customer : KHD

Engine : F6L912

1st version kW : 74.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.4)

Spread cm3 : 0.2

100 s: (0.4)

2nd speed rpm : 325.0

Rack travel in mm : 7.1...7.3

Del.quantity cm3/ : 1.0...1.6

100 s: (0.8...1.7)

Spread cm3 : 0.2

100 s: (0.3)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 51.5...52.5

1000 : (50.0...54.0)

Spread cm3 : 2.50

1000 : (4.00)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Testing:

1st rack travel in: 10.10

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1225...1255

3rd rack travel in: 4.00

Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 67...75

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 6.7

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 325

Rack travel in mm : 7.10...7.30

Rack travel in mm : 2.00

Speed rpm : 435...495

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.10...11.20

2nd speed rpm : 750

Rack travel in m: 12.30...12.50

3rd speed rpm : 950

Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 55.0...57.0

1000 s: (53.0...59.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 115.0...125.0

1000 s: (112.0...128.0)

Rack travel in mm : 19.50...21.00

Remarks:

:

#### APPLICATION

Installation 2300



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 646 271AA  
Injection pump  
Pump designation : PE6A95D410LS2621  
EP type number : 0 410 696 982  
Governor  
Governor design. : RQV300...1250AB1195L  
Governor no. : 0 420 212 172

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 120.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 8.1...8.3

100 s: (7.9...8.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.30

2nd speed rpm : 500  
travel mm : 2.60...2.90

3rd speed rpm : 1000  
travel mm : 5.40...5.60

4th speed rpm : 1300  
travel mm : 7.70...7.80

5th speed rpm : 1380  
travel mm : 8.50...8.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1250

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 81.0...83.0

1000 : (79.0...85.0)

Spread cm3 : 3.50

1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

#### Testing:

1st rack travel in: 8.20  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1345...1375  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 80...88

#### Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.50...6.70

#### CONSTANT REGULATION

Speed rpm : 375...485

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 650  
Rack travel in m: 9.70...9.80  
3rd speed rpm : 850  
Rack travel in m: 9.30...9.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 76.5...79.5  
1000 s: (74.0...82.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

K14

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.40...14.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 9,6 i 2  
 Edition : 26.06.92  
 Replaces : 03.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 646 275  
 Injection pump  
 Pump designation : PE6A95D41DLS2621  
 EP type number : 0 410 696 982  
 Governor  
 Governor design. : RQ300/125DAB1148-1L  
 Governor no. : 0 420 200 104

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 141.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.60...10.70

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.8...1.4

100 s: (0.5...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.60

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1325...1355

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 100

Minimum rack trave: 7.90

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.17

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.60...10.70

2nd speed rpm : 600

Rack travel in m: 11.10...11.20

3rd speed rpm : 915

Rack travel in m: 11.10...11.20

4th speed rpm : 980

Rack travel in m: 10.60...10.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 95.0...98.0

1000 s: (92.5...100.5)

RACK STOP ADJUSTMENT

Speed rpm : 650

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.60

Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 15.30...15.60

Remarks:

: KLEOPATRA

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 646 275AA  
Injection pump  
Pump designation : PE6A95D410LS2621  
EP type number : 0 410 696 982  
Governor  
Governor design. : RQ300/1250AB1148-1L  
Governor no. : 0 420 200 104

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 136.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.10...10.20

Del.quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 9.10

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1330...1360

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

#### Testing:

Speed rpm : 100

Minimum rack trave: 8.00

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.17

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.10...10.20

2nd speed rpm : 650

Rack travel in m: 10.60...10.70

3rd speed rpm : 915

Rack travel in m: 10.30...10.50

4th speed rpm : 980

Rack travel in m: 10.00...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650

Del.quantity cm3/ : 92.0...95.0

1000 s: (89.5...97.5)

#### RACK STOP ADJUSTMENT

Speed rpm : 650

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.10

Speed rpm : 1295...1310

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 15.30...15.60

Remarks:

: KLEOPATRA

# BOSCH INC. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 646 275AB  
Injection pump  
Pump designation : PE6A95D410LS2621  
EP type number : 0 410 696 982  
Governor  
Governor design. : RQ300/1250AB1148-1L  
Governor no. : 0 420 200 104

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 122.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.30...9.40

Del. quantity cm<sup>3</sup>/ : 8.3...8.5

100 s: (8.1...8.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del. quantity cm<sup>3</sup>/ : 1.1...1.7

100 s: (0.8...1.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del. quantity : 83.0...85.0

1000 : (81.0...87.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 8.30

Speed rpm : 1295...1310

2nd rack travel in: 4.00

Speed rpm : 1325...1355

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 100

Minimum rack trave: 8.00

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : 0.17

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 9.30...9.40

2nd speed rpm : 650

Rack travel in m: 9.80...9.90

3rd speed rpm : 915

Rack travel in m: 9.50...9.70

4th speed rpm : 980

Rack travel in m: 9.20...9.50

START CUT-OUT

Speed 1/min : 220 (240)

RACK STOP ADJUSTMENT

Speed rpm : 650

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.30

Speed rpm : 1295...1310

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 15.30...15.60

Remarks:

: KLEOPATRA



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 15,8 n1  
 Edition : 7.8.92  
 Replaces : 19.10.90  
 Test oil : ISO-4113  
 Combination no. : 0 400 649 219  
 Injection pump  
 Pump designation : PE10A95D610/4LS2589  
 EP type number : 0 410 699 994  
 Governor  
 Governor design. : RQV300...1150AB1047D  
 L  
 Governor no. : 0 420 214 242

Customer-spec. information  
 Customer : KHD

Engine : F10L413 FW

1st version kW : 170.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 000

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 10- 9- 4- 3- 6-  
 5- 8- 7- 2

Phasing : 0-27-72-99-144-171-  
 216-243-288-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.60...9.70

Del.quantity cm3/ : 7.5...7.7

100 s: (7.3...7.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.6...1.7)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.10...1.60

2nd speed rpm : 390  
 travel mm : 2.20...2.60

3rd speed rpm : 1195  
 travel mm : 8.70...9.10

4th speed rpm : 1245  
 travel mm : 9.40...9.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 75.0...77.0

1000 : (73.0...79.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 8.60

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1230...1260

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 67...75

Testing:

Speed rpm : 200

Minimum rack travel: 8.40

Speed rpm : 300

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...420

TORQUE CONTROL

Dimension a mm : 1.00

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 9.60...9.70

2nd speed rpm : 500

Rack travel in m: 10.60...10.70

3rd speed rpm : 880

Rack travel in m: 10.30...10.50

4th speed rpm : 990

Rack travel in m: 9.90...10.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 80.5...83.5

1000 s: (78.0...86.0)

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 65.0...70.0

1000 s: (62.5...72.5)

RACK STOP ADJUSTMENT

Speed rpm : 500

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.60

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 15.40...15.80

Remarks:

:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

When accelerating from engine speed "0", no voltage in starting solenoid.

2. Set fuel delivery in fuel-delivery characteristics with stop above the governor housing.

APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AA  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 134.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1325

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 9.2...9.4

100 s: (9.0...9.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1325

Del.quantity : 92.0...94.0

1000 : (90.0...96.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Setting point:

Speed rpm : 800

Rack travel in mm : 1.0

Testing:

1st rack travel in: 8.80  
Speed rpm : 1365...1375  
2nd rack travel in: 4.00  
Speed rpm : 1390...1420  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1325  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 650  
Rack travel in m: 9.80...10.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1365...1375

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.00  
1000 s: (5.00)

Remarks:

:

K24

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AB  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 141.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 96.5...98.5

1000 : (94.5...100.5)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 9.40

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1310...1340  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever

position degrees: 21...29

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 520...580

Speed rpm : 700

Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 10.40...10.50

2nd speed rpm : 650

Rack travel in m: 10.90...11.00

3rd speed rpm : 850

Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 95.0...98.0

1000 s: (92.5...100.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0

1000 s: (6.5...17.5)

Spread cm<sup>3</sup> : 3.00

1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 149AC  
 Injection : mp  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1325A8C1002  
 Governor no. : 0 420 232 310

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 134.0  
 Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.10...10.20

Del.quantity cm<sup>3</sup>/ : 9.2...9.4

100 s: (9.0...9.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 92.0...94.0

1000 : (90.0...96.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 9.10

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1305...1335  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm: 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 10.10...10.20  
2nd speed rpm : 650  
Rack travel in m: 10.60...10.70  
3rd speed rpm : 850  
Rack travel in m: 10.20...10.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 90.5...93.5  
1000 s: (88.0...96.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.10  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AD  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 130.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.7°)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.80...9.90

Del.quantity cm3/ : 8.9...9.1

100 s: (8.7...9.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 89.0...91.0

1000 : (87.0...93.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.80

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1305...1335  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 650  
Rack travel in m: 10.30...10.40  
3rd speed rpm : 850  
Rack travel in m: 9.90...10.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 87.5...90.5  
1000 s: (85.0...93.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AE  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 127.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.60...9.70

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.60

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1300...1330  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack travel: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 650  
Rack travel in m: 10.10...10.20  
3rd speed rpm : 850  
Rack travel in m: 9.70...9.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 83.5...86.5  
1000 s: (81.0...89.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (5.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AF  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 123.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Over-flow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall-thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.40...9.50

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever

position degrees: ?

Testing:

1st rack travel in: 8.40

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1300...1330  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.40...9.50  
2nd speed rpm : 650  
Rack travel in m: 9.90...10.00  
3rd speed rpm : 850  
Rack travel in m: 9.50...9.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 79.5...82.5  
1000 s: (77.0...85.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.40  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 24.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 149AG  
 Injection pump  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1325A8C1002  
 L  
 Governor no. : 0 420 232 310

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 127.0  
 Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1325

Rack travel in mm : 9.60...9.70

Del.quantity cm3/ : 8.7...8.9

100 s: (8.5...9.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1325

Del.quantity : 87.0...89.0

1000 : (85.0...91.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.60

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1300...1330  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.60...9.70  
2nd speed rpm : 650  
Rack travel in m: 10.10...10.20  
3rd speed rpm : 850  
Rack travel in m: 9.70...9.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 83.5...86.5  
1000 s: (81.0...89.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.60  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.00  
1000 s: (5.00)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AH  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 119.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 9.10...9.20

Del.quantity cm3/ : 8.0...8.2

100 s: (7.8...8.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del.quantity : 80.0...82.0

1000 : (78.0...84.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.10

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1300...1330  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 9.10...9.20  
2nd speed rpm : 650  
Rack travel in m: 9.60...9.70  
3rd speed rpm : 850  
Rack travel in m: 9.20...9.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 74.5...77.5  
1000 s: (72.0...80.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.10  
Speed rpm : 1290...1300

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.00  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 149AI  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 134.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 10.40...10.50

Del.quantity cm<sup>3</sup>/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 9.40

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1220...1250  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 10.40...10.50  
2nd speed rpm : 650  
Rack travel in m: 10.90...11.00  
3rd speed rpm : 850  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 94.5...97.5  
1000 s: (92.0...100.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AJ  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310  
Customer-spec. information  
Customer : KHD  
Engine : F6L413F  
1st version kW : 124.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test lines : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 9.80...9.90  
Del.quantity cm3/ : 8.6...8.8  
100 s: (8.4...9.0)  
Spread cm3 : 0.3  
100 s: (0.6)  
2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1  
Del.quantity cm3/ : 0.9...1.5  
100 s: (0.6...1.7)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del.quantity : 86.0...88.0  
1000 : (84.0...90.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:  
1st rack travel in: 8.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00

Speed rpm : 1215...1245  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.80...9.90  
2nd speed rpm : 650  
Rack travel in m: 10.30...10.40  
3rd speed rpm : 850  
Rack travel in m: 9.90...10.10

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 82.5...85.5  
1000 s: (80.0...88.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.80  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 149AK  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 118.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 8.1...8.3

100 s: (7.9...8.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 81.0...83.0

1000 : (79.0...85.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.30

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1215...1245  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 650  
Rack travel in m: 9.80...9.90  
3rd speed rpm : 850  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 76.5...79.5  
1000 s: (74.0...82.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AL  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 112.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.00...9.10

Del.quantity cm3/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.00

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1210...1240  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 650  
Rack travel in m: 9.50...9.60  
3rd speed rpm : 850  
Rack travel in m: 9.10...9.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 71.5...74.5  
1000 s: (69.0...77.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 149AM  
 Injection pump  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1325A8C1002  
 L  
 Governor no. : 0 420 232 310  
 Customer-spec. information  
 Customer : KHD  
 Engine : F6L413F  
 1st version kw : 101.0<sup>4</sup>  
 Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150  
 Rack travel in mm : 8.40...8.50  
 Del.quantity cm3/ : 6.9...7.1  
 100 s: (6.7...7.3)  
 Spread cm3 : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.6...1.7)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1150  
 Del.quantity : 69.0...71.0  
 1000 : (67.0...73.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: ?

Testing:  
 1st rack travel in: 7.40  
 Speed rpm : 1190...1200  
 2nd rack travel in: 4.00

Speed rpm : 1210...1240  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.40...8.50  
2nd speed rpm : 650  
Rack travel in m: 8.90...9.00  
3rd speed rpm : 850  
Rack travel in m: 8.50...8.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 61.5...64.5  
1000 s: (59.0...67.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.40  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AN  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 113.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL. LOAD STOP

1st version

Speed rpm : 1075

Del.quantity : 79.0...81.0

1000 : (77.0...83.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.30

Speed rpm : 1115...1125

2nd rack travel in: 4.00

Speed rpm : 1140...1170  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 650  
Rack travel in m: 9.80...9.90  
3rd speed rpm : 850  
Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 76.5...79.5  
1000 s: (74.0...82.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 1115...1125

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 149A0  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310  
  
Customer-spec. information  
Customer : KHD  
  
Engine : F6L413F  
  
1st version kW : 105.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 33...42  
  
Overflow valve : 1 419 992 198  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 014  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315  
  
Tolerance + - ° : 0.50 (0.75)  
  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050  
  
Rack travel in mm : 8.90...9.00  
  
Del. quantity cm3/ : 7.4...7.6  
100 s: (7.2...7.8)  
  
Spread cm3 : 0.3  
100 s: (0.6)  
  
2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1  
Del. quantity cm3/ : 0.9...1.5  
100 s: (0.6...1.7)  
  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del. quantity : 74.0...76.0  
1000 : (72.0...78.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?  
  
Testing:  
1st rack travel in: 7.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00

Speed rpm : 1100...1130  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever

position degrees: 21...29

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 520...580

Speed rpm : 700

Maximum rack travel: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 8.90...9.00

2nd speed rpm : 650

Rack travel in m: 9.40...9.50

3rd speed rpm : 850

Rack travel in m: 9.00...9.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 69.5...72.5

1000 s: (67.0...75.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.90

Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AP  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kw : 90.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 8.10...8.20

Del.quantity cm3/ : 6.3...6.5  
100 s: (6.1...6.7)

Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.1  
Del.quantity cm3/ : 0.9...1.5  
100 s: (0.6...1.7)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Del.quantity : 63.0...65.0  
1000 : (61.0...67.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:  
1st rack travel in: 7.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00

Speed rpm : 1095...1125  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 8.10...8.20  
2nd speed rpm : 650  
Rack travel in m: 8.60...8.70  
3rd speed rpm : 850  
Rack travel in m: 8.20...8.40

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 56.5...59.5  
1000 s: (54.0...62.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 149AQ  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 96.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 74.0...76.0

1000 : (72.0...78.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.30

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 950...980  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

LOW IDLE 1  
Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19 00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 650  
Rack travel in m: 9.40...9.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 69.5...72.5  
1000 s: (67.0...75.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AR  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
L  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 107.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1075

Rack travel in mm : 9.00...9.10

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1075

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.00

Speed rpm : 1115...1125

2nd rack travel in: 4.00

Speed rpm : 1140...1170  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1075  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 650  
Rack travel in m: 9.50...9.60  
3rd speed rpm : 850  
Rack travel in m: 9.10...9.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 73.5...76.5  
1000 s: (71.0...79.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 1115...1125

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 676 149AS  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1325A8C1002  
Governor no. : 0 420 232 310

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 100.0  
Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 8.90...9.00

Del.quantity cm3/ : 7.3...7.5

100 s: (7.1...7.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 73.0...75.0

1000 : (71.0...77.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control Lever

position degrees: ?

Testing:

1st rack travel in: 7.90

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1060...1090  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 21...29  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 520...580  
Speed rpm : 700  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 8.90...9.00  
2nd speed rpm : 650  
Rack travel in m: 9.50...9.60  
3rd speed rpm : 850  
Rack travel in m: 9.00...9.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 70.5...73.5  
1000 s: (68.0...76.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.90  
Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.90...6.10

Del.quantity cm3/ : 9.0...15.0  
1000 s: (6.5...17.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:



## BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 149AT  
 Injection pump  
 Pump designation : PE6A95D410LS245D  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1325A8C1002  
 Governor no. : 0 420 232 310

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kw : 90.0  
 Rated speed : 2650

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 8.30...8.40

Del.quantity cm<sup>3</sup>/ : 6.5...6.7

100 s: (6.3...6.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 65.0...67.0

1000 : (63.0...69.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 7.30

Speed rpm : 1040...1050

2nd rack travel in: 4.00

Speed rpm : 1060...1090  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever

position degrees: 21...29

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 520...580

Speed rpm : 700

Maximum rack travel: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000

Rack travel in m: 8.30...8.40

2nd speed rpm : 650

Rack travel in m: 8.90...9.00

3rd speed rpm : 850

Rack travel in m: 8.40...8.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 63.5...66.5

1000 s: (61.0...69.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.30

Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Rack travel in mm : 14.00...14.40

#### LOW IDLE

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 9.0...15.0

1000 s: (6.5...17.5)

Spread cm<sup>3</sup> : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 150AA  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1000A7C1002  
L  
Governor no. : 0 420 232 309

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 96.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 9.30...9.40

Del.quantity cm3/ : 7.4...7.6

100 s: (7.2...7.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Del.quantity : 74.0...76.0

1000 : (72.0...78.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.30

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 950...980  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 430...490  
Speed rpm : 600  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 650  
Rack travel in m: 9.40...9.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 69.5...72.5  
1000 s: (67.0...75.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 150AB  
 Injection pump  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1000A7C1002  
 L  
 Governor no. : 0 420 232 309

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 92.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 9.00...9.10

Del.quantity cm3/ : 7.0...7.2

100 s: (6.8...7.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 70.0...72.0

1000 : (68.0...74.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.00

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 950...980  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control Lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 430...490  
Speed rpm : 600  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 650  
Rack travel in m: 9.20...9.30

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 65.5...68.5  
1000 s: (63.0...71.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 150AC  
 Injection pump  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1000A7C1002  
 Governor no. : 0 420 232 309

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 83.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 8.50...8.60

Del.quantity cm3/ : 6.2...6.4

100 s: (6.0...6.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 62.0...64.0

1000 : (60.0...66.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 7.50

Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm : 950...980  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 430...490  
Speed rpm : 600  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 8.50...8.60  
2nd speed rpm : 650  
Rack travel in m: 8.60...8.70

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650  
Del.quantity cm3/ : 59.5...62.5  
1000 s: (57.0...65.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 7.50  
Speed rpm : 940...950

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 150AD  
 Injection pump  
 Pump designation : PE6A95D410LS2450  
 EP type number : 0 410 696 989  
 Governor  
 Governor design. : RSV300...1000A7C1002  
 L  
 Governor no. : 0 420 232 309  
 Customer-spec. information  
 Customer : KHD  
 Engine : F6L413F  
 1st version kW : 77.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750  
 Rack travel in mm : 9.20...9.30  
 Del.quantity cm3/ : 6.9...7.1  
 100 s: (6.7...7.3)  
 Spread cm3 : 0.3  
 100 s: (0.6)  
 2nd speed rpm : 300.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm3/ : 0.9...1.5  
 100 s: (0.6...1.7)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Del.quantity : 69.0...71.0  
 1000 : (67.0...73.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: ?

Testing:  
 1st rack travel in: 8.20  
 Speed rpm : 790...800  
 2nd rack travel in: 4.00

Speed rpm : 815...845  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 430...490  
Speed rpm : 600  
Maximum rack travel: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 9.20...9.30

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 790...800

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 676 150AE  
  
Injection pump  
Pump designation : PE6A95D410LS2450  
EP type number : 0 410 696 989  
Governor  
Governor design. : RSV300...1000A7C1002  
L  
Governor no. : 0 420 232 309

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 73.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 8.80...8.90

Del. quantity cm<sup>3</sup>/ : 6.3...6.5

100 s: (6.1...6.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.1

Del. quantity cm<sup>3</sup>/ : 0.9...1.5

100 s: (0.6...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750

Del. quantity : 63.0...65.0

1000 : (61.0...67.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 7.80

Speed rpm : 790...800

2nd rack travel in: 4.00

Speed rpm : 810...840  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 24...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 430...490  
Speed rpm : 600  
Maximum rack trave: 1.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 750  
Rack travel in m: 8.80...8.90

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 7.80  
Speed rpm : 790...800

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.00...14.40

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 676 173AA  
 Injection pump  
 Pump designation : PE6A95D410LS2587  
 EP type number : 0 410 696 983  
 Governor  
 Governor design. : RSV300...1150A8C1002  
 -1L  
 Governor no. : 0 420 232 379

Customer-spec. information  
 Customer : KHD

Engine : F6L413F

1st version kW : 112.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
 : (1.45...1.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 6- 5- 4- 3- 2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 7.9...8.1

100 s: (7.7...8.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 79.0...81.0

1000 : (77.0...83.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: ?

Testing:

1st rack travel in: 8.20

Speed rpm : 1190...1200

2nd rack travel in: 4.00

Speed rpm : 1215...1245  
3rd rack travel in: 4.00  
Speed rpm : 1250...1280  
4th rack travel in: 1415  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 13...21

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.0

Speed rpm : 300

Rack travel in mm : 5.90...6.60

Rack travel in mm : 2.00

Speed rpm : 540...600

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 9.20...9.30

2nd speed rpm : 650

Rack travel in m: 9.80...9.90

3rd speed rpm : 850

Rack travel in m: 9.40...9.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 650

Del.quantity cm<sup>3</sup>/ : 78.5...81.5

1000 s: (76.0...84.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 500

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.20

Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0

1000 s: (117.0...133.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 845 081AA  
  
Injection pump  
Pump designation : PESSA95D410RS2417  
EP type number : 0 410 895 993  
Governor  
Governor design. : RQV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F5L413FR

1st version kW : 112.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 9.5...9.7

100 s : (9.3...9.9)

Spread cm<sup>3</sup> : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s : (0.9...2.0)

Spread cm<sup>3</sup> : 0.3

100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.20

2nd speed rpm : 500

travel mm : 3.20...3.50

3rd speed rpm : 1000

travel mm : 6.20...6.40

4th speed rpm : 1250

travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1280

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 95.0...97.0

1000 : (93.0...99.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 8.70  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1340...1370  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 365...480

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 600  
Rack travel in m: 10.00...10.10  
3rd speed rpm : 750  
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 88.5...91.5  
1000 s: (86.0...94.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 845 081AB  
Injection pump  
Pump designation : PES5A95D410RS2417  
EP type number : 0 410 895 993  
Governor  
Governor design. : RQV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F5L413FR

1st version kW : 109.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

M21

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.50...9.60

Del.quantity cm<sup>3</sup>/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...5.9

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.20

2nd speed rpm : 500

travel mm : 3.20...3.50

3rd speed rpm : 1000

travel mm : 6.20...6.40

4th speed rpm : 1250

travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1280

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 8.50  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1340...1370  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 80...88  
Rack travel in mm : 6.5

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 365...480

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.50...9.60  
2nd speed rpm : 600  
Rack travel in m: 9.80...9.90  
3rd speed rpm : 750  
Rack travel in m: 9.60...9.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.5...89.5  
1000 s: (84.0...92.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.50  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

M22

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 845 082AA  
  
Injection pump  
Pump designation : PES5A95D410RS2680  
EP type number : 0 410 895 972  
Governor  
Governor design. : RQV300...1150AB1217L  
Governor no. : 0 420 212 186

Customer-spec. information  
Customer : KHD

Engine : F5L413FRW

1st version kW : 79.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 5- 4- 2

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 7.80...7.90

Del.quantity cm<sup>3</sup>/ : 6.6...6.8

100 s: (6.4...7.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 66.0...68.0

1000 : (64.0...70.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 6.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 65...73

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...415

TORQUE CONTROL

Dimension a mm : 1.50  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 7.80...7.90  
2nd speed rpm : 700  
Rack travel in m: 9.30...9.40  
3rd speed rpm : 950  
Rack travel in m: 8.60...8.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 73.5...76.5  
1000 s: (71.0...79.0)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 64.5...69.5  
1000 s: (62.0...72.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 6.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.30...14.70

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

2. Set fuel delivery in fuel-delivery  
characteristics with stop above the  
governor housing.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 544AA  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 134.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

M25

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 9.70...9.80

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.20

2nd speed rpm : 500

travel mm : 3.20...3.50

3rd speed rpm : 1000

travel mm : 6.20...6.40

4th speed rpm : 1250

travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1280

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 8.70  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1340...1370  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 84...92

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 370...485

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 600  
Rack travel in m: 10.00...10.10  
3rd speed rpm : 750  
Rack travel in m: 9.80...10.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 88.5...91.5  
1000 s: (86.0...94.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 544AB  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 127.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 9.30...9.40  
Del.quantity cm3/ : 9.0...9.2  
100 s: (8.8...9.4)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.4...6.6  
Del.quantity cm3/ : 1.2...1.8  
100 s: (0.9...2.0)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.20  
2nd speed rpm : 500  
travel mm : 3.20...3.50  
3rd speed rpm : 1000  
travel mm : 6.20...6.40  
4th speed rpm : 1250  
travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1280  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Del.quantity : 90.0...92.0  
1000 : (88.0...94.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 8.30  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 84...92

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 370...485

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.30...9.40  
2nd speed rpm : 600  
Rack travel in m: 9.60...9.70  
3rd speed rpm : 750  
Rack travel in m: 9.40...9.60

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 83.5...86.5  
1000 s: (81.0...89.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.30  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 544AC  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RGV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kw : 123.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

NO1

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 9.00...9.10  
Del.quantity cm3/ : 8.6...8.8  
100 s: (8.4...9.0)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.4...6.6  
Del.quantity cm3/ : 1.2...1.8  
100 s: (0.9...2.0)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.20  
2nd speed rpm : 500  
travel mm : 3.20...3.50  
3rd speed rpm : 1000  
travel mm : 6.20...6.40  
4th speed rpm : 1250  
travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1280  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Del.quantity : 86.0...88.0  
1000 : (84.0...90.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 8.00  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 84...92

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 370...485

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 9.00...9.10  
2nd speed rpm : 600  
Rack travel in m: 9.30...9.43  
3rd speed rpm : 750  
Rack travel in m: 9.10...9.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 78.5...81.5  
1000 s: (76.0...84.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.00  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 846 544AD  
  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQV300...1250AB1211L  
Governor no. : 0 420 212 184

Customer-spec. information  
Customer : KHD

Engine : F6L413FR

1st version kW : 117.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)  
Rack travel in mm : 9.00...12.00

N03

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250  
Rack travel in mm : 8.70...8.81  
Del.quantity cm<sup>3</sup>/ : 8.2...8.4  
100 s : (8.0...8.6)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.4...6.6  
Del.quantity cm<sup>3</sup>/ : 1.2...1.8  
100 s : (0.9...2.0)  
Spread cm<sup>3</sup> : 0.3  
100 s : (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 1.00...1.20  
2nd speed rpm : 500  
travel mm : 3.20...3.50  
3rd speed rpm : 1000  
travel mm : 6.20...6.40  
4th speed rpm : 1250  
travel mm : 8.20...8.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1280  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1250  
Del.quantity : 82.0...84.0  
1000 : (80.0...86.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 7.70  
Speed rpm : 1290...1300  
2nd rack travel in: 4.50  
Speed rpm : 1330...1360  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 84...92

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 370...485

TORQUE CONTROL

Dimension a mm : 0.30  
Torque control curve - 1st version  
1st speed rpm : 1250  
Rack travel in m: 8.70...8.80  
2nd speed rpm : 600  
Rack travel in m: 9.00...9.10  
3rd speed rpm : 750  
Rack travel in m: 8.80...9.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 74.5...77.5  
1000 s: (72.0...80.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.70  
Speed rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 12.0...18.0  
1000 s: (9.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 400 846 545AA  
  
Injection pump  
Pump designation : PES6A95D410RS2681  
EP type number : 0 410 896 918  
Governor  
Governor design. : RQV300...1150AB1217L  
Governor no. : 0 420 212 186

Customer-spec. information  
Customer : KHD

Engine : F6L413FRW

1st version kW : 96.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Rack travel in mm : 9.00...12.00

N05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 7.80...7.90  
Del. quantity cm3/ : 6.6...6.8  
100 s: (6.4...7.0)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.4...6.6  
Del. quantity cm3/ : 1.2...1.8  
100 s: (0.9...2.0)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.30...1.50  
2nd speed rpm : 500  
travel mm : 3.40...3.60  
3rd speed rpm : 800  
travel mm : 5.20...5.60  
4th speed rpm : 1150  
travel mm : 7.80...8.20

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1200  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1150  
Del. quantity : 66.0...68.0  
1000 : (64.0...70.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 6.80  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 65...73

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...415

TORQUE CONTROL

Dimension a mm : 1.50  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 7.80...7.90  
2nd speed rpm : 700  
Rack travel in m: 9.30...9.40  
3rd speed rpm : 950  
Rack travel in m: 8.60...8.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 73.5...76.5  
1000 s: (71.0...79.0)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 64.5...69.5  
1000 s: (62.0...72.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 6.80  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.40...14.80

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Below-ground operation

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 24.07.92  
Replaces : 2300  
Test oil : ISO-4113  
  
Combination no. : 0 400 846 545AB  
  
Injection pump  
Pump designation : PES6A95D41ORS2681  
EP type number : 0 410 896 918  
Governor  
Governor design. : RQV300...1150AB1217L  
Governor no. : 0 420 212 186

Customer-spec. information  
Customer : KHD

Engine : F6L413FRW

1st version kW : 86.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)

Rack travel in mm : 9.00...12.00

N07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 7.30...7.40

Del.quantity cm3/ : 6.0...6.2

100 s: (5.8...6.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.30...1.50

2nd speed rpm : 500

travel mm : 3.40...3.60

3rd speed rpm : 800

travel mm : 5.20...5.60

4th speed rpm : 1150

travel mm : 7.80...8.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1200

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 60.0...62.0

1000 : (58.0...64.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 6.30  
Speed rpm : 1190...1200  
2nd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 65...73

Testing:

Speed rpm : 100  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...415

TORQUE CONTROL

Dimension a mm : 1.40  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 7.30...7.40  
2nd speed rpm : 700  
Rack travel in m: 8.70...8.80  
3rd speed rpm : 950  
Rack travel in m: 8.00...8.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 64.5...67.5  
1000 s: (62.0...70.0)  
Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 64.5...69.5  
1000 s: (62.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 6.30  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.40...14.80

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

APPLICATION

Below-ground operation



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 m  
 Edition : 26.06.92  
 Replaces : 9.86  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 548  
 Injection pump  
 Pump designation : PES6A95D410RS2715  
 EP type number : 0 410 896 911  
 Governor  
 Governor design. : RQV300...1250AB1158-1L  
 Governor no. : 0 420 212 188

Customer-spec. information  
 Customer : KHD

Engine : BF6L913

1st version kW : 140.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 9.4...9.6

100 s: (9.2...9.8)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.8)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 0.80...0.90

2nd speed rpm : 600  
 travel mm : 3.60...3.90

3rd speed rpm : 900  
 travel mm : 5.20...5.40

4th speed rpm : 1200  
 travel mm : 7.80...7.90

5th speed rpm : 1400  
 travel mm : 10.00...10.40

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1265

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 700

Del.quantity : 94.0...96.0

1000 : (92.0...98.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 119...127

Testing:

1st rack travel in: 13.00

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1400...1430

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 61...69

Testing:

Speed rpm : 100

Minimum rack travel: 6.50

Speed rpm : 300

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 14.00...14.10

2nd speed rpm : 500

Rack travel in m: 14.00...14.20

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 10.50...10.70

2nd pressure hPa : 390

Rack travel in m: 13.10...13.20

3rd pressure hPa : 245

Rack travel in m: 11.60...11.80

START CUT-OUT

Speed 1/min : 220 (240)

N10

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 92.5...95.5

1000 s: (90.0...98.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 53.0...55.0

1000 s: (51.0...57.0)

## RACK STOP ADJUSTMENT

Speed rpm : 600

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1290...1300

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 115.0...125.0

1000 s: (112.0...128.0)

Rack travel in mm : 15.20...15.60

Remarks:

:

On activation of the starting solenoid,  
the start position must be reached.

## APPLICATION

GMC-truck

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 568AA  
 Injection pump  
 Pump designation : PES6A95D41ORS2416  
 EP type number : 0 410 896 961  
 Governor  
 Governor design. : RQV300...1150AB1211-1L  
 Governor no. : 0 420 212 217

Customer-spec. information  
 Customer : KHD

Engine : F6L413FR-ALLG.

1st version kW : 124.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.50...9.60

Del. quantity cm3/ : 9.3...9.5

100 s: (9.1...9.7)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del. quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.20...1.30

2nd speed rpm : 325

travel mm : 1.70...1.80

3rd speed rpm : 375

travel mm : 2.50...2.60

4th speed rpm : 1265

travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del. quantity : 93.0...95.0

1000 : (91.0...97.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 8.50  
Speed rpm : 1190...1200  
2nd rack travel in: 4.50  
Speed rpm : 1240...1270  
4th rack travel in: 1370  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 83...91

Testing:

Speed rpm : 200  
Minimum rack travel: 10.30  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 310...450

TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.50...9.60  
2nd speed rpm : 650  
Rack travel in m: 9.70...9.80  
3rd speed rpm : 300  
Rack travel in m: 9.50...9.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 87.5...90.5  
1000 s: (85.0...93.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.50  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

N12

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
Edition : 31.07.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 400 846 568AB  
Injection pump  
Pump designation : PES6A95D410RS2416  
EP type number : 0 410 896 961  
Governor  
Governor design. : RQV300...1150AB1211-1L  
Governor no. : 0 420 212 217

Customer-spec. information  
Customer : KHD

Engine : F6L413FR-ALLG.

1st version kW : 112.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
: (1.85...2.05)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 8.90...9.00

Del.quantity cm<sup>3</sup>/ : 8.3...8.5

100 s: (8.1...8.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm<sup>3</sup>/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.30

2nd speed rpm : 325  
travel mm : 1.70...1.80

3rd speed rpm : 375  
travel mm : 2.50...2.60

4th speed rpm : 1265  
travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 83.0...85.0

1000 : (81.0...87.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:

1st rack travel in: 7.90  
Speed rpm : 1190...1200  
2nd rack travel in: 4.50  
Speed rpm : 1240...1270  
4th rack travel in: 1370  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 83...91

Testing:

Speed rpm : 200  
Minimum rack travel: 10.30  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION

Speed rpm : 310...450

TORQUE CONTROL

Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 8.90...9.00  
2nd speed rpm : 650  
Rack travel in m: 9.10...9.20  
3rd speed rpm : 800  
Rack travel in m: 9.00...9.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 77.5...80.5  
1000 s: (75.0...83.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.90  
Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

N14

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD  
 Edition : 31.07.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 400 846 568AC  
 Injection pump  
 Pump designation : PES6A95D410RS2416  
 EP type number : 0 410 896 961  
 Governor  
 Governor design. : RQV3C0...1150AD1211-1L  
 Governor no. : 0 420 212 217

Customer-spec. information  
 Customer : KHD

Engine : F6L413FR-ALLG.

1st version kW : 118.0  
 Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 9.20...9.30

Del.quantity cm3/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.6...6.8

Del.quantity cm3/ : 1.2...1.8

100 s: (0.9...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.20...1.30

2nd speed rpm : 325  
 travel mm : 1.70...1.80

3rd speed rpm : 375  
 travel mm : 2.50...2.60

4th speed rpm : 1265  
 travel mm : 9.40...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 8.20  
Speed rpm : 1190...1200  
2nd rack travel in: 4.50  
Speed rpm : 1240...1270  
4th rack travel in: 1370  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 83...91

Testing:  
Speed rpm : 200  
Minimum rack travel: 10.30  
Speed rpm : 300  
Rack travel in mm : 6.60...6.80

CONSTANT REGULATION  
Speed rpm : 310...450

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 9.20...9.30  
2nd speed rpm : 650  
Rack travel in m: 9.40...9.50  
3rd speed rpm : 800  
Rack travel in m: 9.20...9.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 82.5...85.5  
1000 s: (80.0...88.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 8.20  
Speed rpm : 1190...1200

#### STARTING FUEL DELIVERY

Speed rpm : 100

N16

Del.quantity cm<sup>3</sup>/ : 120.0...130.0  
1000 s: (117.0...133.0)  
Rack travel in mm : 14.20...14.60

Remarks:

:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 y 1  
Edition : 24.07.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 400 846 580

Injection pump  
Pump designation : PES6A95D320RS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RQV350...1350AB1248-1R  
Governor no. : 0 420 213 121

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA 360

1st version kW : 138.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55  
(2.40...2.60)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 12.40...12.50

Del.quantity cm<sup>3</sup>/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.1

100 s: (1.5...2.3)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1400...1430  
2nd rack travel in: 4.00  
Speed rpm : 1535...1545  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.40...12.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 215  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 345  
Rack travel in m: 11.60...12.00

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 71.0...75.0  
1000 s: (69.0...77.0)

BREAKAWAY

N18

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1400...1430

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (15.0...23.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1818796C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC 7,6 z 1  
Edition : 24.07.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 400 846 603

Injection pump  
Pump designation : PES6A95D32ORS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RQV350...1350AB1251-1R  
Governor no. : 0 420 213 125

Customer-spec. information  
Customer : NAVISTAR

Engine : DT 360

1st version kW : 142.0  
Rated speed : 2700

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.45...2.55  
(2.40...2.60)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1350

Rack travel in mm : 12.30...12.40

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 7.30...7.50

2nd speed rpm : 1460

travel mm : 8.10...8.50

3rd speed rpm : 550

travel mm : 3.10...3.70

4th speed rpm : 350

travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1350

Aneroid pressure h: 900

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:  
1st rack travel in: 11.30  
Speed rpm : 1400...1430  
2nd rack travel in: 4.00  
Speed rpm : 1535...1545  
4th rack travel in: 1625  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 10...18

Testing:  
Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION  
Speed rpm : 350...500

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1350  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 850  
Rack travel in m: 13.10...13.20  
3rd speed rpm : 1200  
Rack travel in m: 12.70...12.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 230  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 525  
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

N20

1st version  
Aneroid pressure h: 900  
Speed rpm : 850  
Del.quantity cm3/ : 96.0...100.0  
1000 s: (94.0...102.0)  
Spread cm3 : 5.00  
1000 s: (7.00)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 66.0...70.0  
1000 s: (64.0...72.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1400...1430

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...155.0  
1000 s: (130.0...160.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (14.5...23.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: NAVISTAR #1818798C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 24.07.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 400 846 606

Injection pump  
Pump designation : PES6A95D320RS2779  
EP type number : 0 410 896 903  
Governor  
Governor design. : RGV350...1200AB1236-8R  
Governor no. : 0 420 213 127

Customer spec. information  
Customer : NAVISTAR

Engine : DT 466

1st version kW : 145.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Test nozzle holder  
assembly : 1 688 901 110

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75  
: (2.60...2.80)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 13.10...13.20

Del.quantity cm3/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm3/ : 1.6...2.0  
100 s: (1.3...2.2)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1400  
travel mm : 8.60...9.00  
2nd speed rpm : 1250  
travel mm : 7.30...7.50  
3rd speed rpm : 550  
travel mm : 3.10...3.70  
4th speed rpm : 350  
travel mm : 1.30...1.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 900  
Del.quantity : 97.0...99.0  
1000 : (95.0...101.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 44...52

Testing:

1st rack travel in: 12.10  
Speed rpm : 1255...1285  
2nd rack travel in: 4.00  
Speed rpm : 1400...1410  
4th rack travel in: 1525  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 11...19

Testing:

Speed rpm : 100  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

Speed rpm : 350...500

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.70  
2nd pressure hPa : 225  
Rack travel in m: 10.50...10.60  
3rd pressure hPa : 460  
Rack travel in m: 11.90...12.30

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 67.0...71.0  
1000 s: (65.0...73.0)

BREAKAWAY

N22

1st version  
1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1255...1285

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...170.0  
1000 s: (125.0...175.0)  
Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: NAVISTAR #1819325C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 L 9  
Edition : 21.05.92  
Replaces : 09.91  
Test oil : ISO-4113

Combination no. : 0 400 866 129

Injection pump  
Pump designation : PES6A100D320/3RS2763  
EP type number : 0 410 806 006  
Governor  
Governor design. : RSV400...1100ADC2190  
-27R  
Governor no. : 0 420 233 225

Customer-spec. information  
Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 111.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 9.70...9.80

Del.quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 4.9...5.1

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (0.9...1.8)

Spread cm<sup>3</sup> : 0.6

100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 4.00

1000 : (6.50)

## RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 8.70  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1230...1240  
3rd rack travel in: 4.00  
Speed rpm : 1225...1255  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 35...43  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.40...4.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 9.70...9.80  
2nd speed rpm : 750  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 96.5...100.5  
1000 s: (94.5...102.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 8.70  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 150.0...170.0  
1000 s: (145.0...175.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 12.0...16.0  
1000 s: (9.5...18.5)

N24

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

#### Remarks:

: C.D.C. # 3915973

Adjust stop lever to 0.5...1.0 mm  
before stop.

Start-of-delivery mark 11° cam angle  
after start of delivery cyl. 1

Adjustment without torque-control  
spring retainer with 0.5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : KHD 6,1 w 1  
 Edition : 26.06.92  
 Replaces : 08.91  
 Test oil : ISO-4113  
 Combination no. : 0 400 866 173  
 Injection pump  
 Pump designation : PES6A85D410/3RS2611  
 EP type number : 0 410 886 902  
 Governor  
 Governor design. : RSV325...1200AOC2148  
 -1L  
 Governor no. : 0 420 232 567

Customer-spec. information  
 Customer : KHD

Engine : F6L913 H

1st version kW : 85.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.40...10.50

Del. quantity cm<sup>3</sup>/ : 6.1...6.2

100 s: (5.9...6.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

2nd speed rpm : 325.0

Rack travel in mm : 8.4...8.6

Del. quantity cm<sup>3</sup>/ : 0.8...1.4

100 s: (0.6...1.6)

Spread cm<sup>3</sup> : 0.2

100 s: (0.4)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del. quantity : 61.5...62.5

1000 : (59.5...64.5)

Spread cm<sup>3</sup> : 3.00

1000 : (5.00)

## RATED SPEED

1st version

Control lever

position degrees: 100...108

Testing:

1st rack travel in: 9.40

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1295...1325

4th rack travel in: 1460

Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever

position degrees: 72...80

Setting point w/out bumper spring

Speed rpm : 325

Rack travel in mm : 8.5

Speed rpm : 325

Rack travel in mm : 8.40...8.60

Rack travel in mm : 2.00

Speed rpm : 440...500

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200

Rack travel in m: 10.40...10.50

2nd speed rpm : 500

Rack travel in m: 11.00...11.20

3rd speed rpm : 800

Rack travel in m: 11.00...11.20

4th speed rpm : 1050

Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 800

Del.quantity cm3/ : 54.0...56.0

1000 s: (51.5...58.5)

Speed rpm : 1050

Del.quantity cm3/ : 59.0...61.0

1000 s: (56.5...63.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.40

Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 115.0...125.0

1000 s: (112.0...128.0)

Rack travel in mm : 17.60...18.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CAS 4,9 a 1  
 Edition : 29.07.92  
 Replaces : 01.08.89  
 Test oil : ISO-4113  
 Combination no. : 0 400 874 160  
 Injection pump  
 Pump designation : PES4A85D420LS2263  
 Governor  
 Governor design. : RSV375...1G00A2B547D  
 R

Customer-spec. information  
 Customer : CASE

Engine : A 301 BD

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : WS 187P (CASE)

Inlet press., bar : 1.5

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 9 681 230 706

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00x2,00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Prestroke mm : 2,15...2,25  
 : (2,10...2,30)  
 Rack travel in mm : 9,00...12,00  
 Firing order : 1-3-4-2

Phasing : 0-90-180-270  
 Tolerance + - ° : 0,50 (0,75)

## BASIC SETTING

1st speed rpm : 1000  
 Rack travel in mm : 9,00  
 Del.quantity cm3/ : 4,35...4,55  
 100 s : (-)  
 2nd speed rpm : 200  
 Rack travel in mm : 6,00  
 Del.quantity cm3/ : 1,15...1,75  
 100 s : (-)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0,30...0,70

Governor spring pre-tension  
 Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Del.quantity : 70,0...71,0  
 1000 : (69,0...72,0)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 37...45

Testing:  
 1st rack travel in: 11.20  
 Speed rpm : 1030...1050  
 2nd rack travel in: 5,60  
 Speed rpm : 1065...1095  
 4th rack travel in: 1200  
 Speed rpm : 0,20...1,20

## LOW IDLE 1

Control lever  
 position degrees: 17...25  
 Setting point w/out bumper spring  
 Speed rpm : 375  
 Rack travel in mm : 7,50

Testing:  
 Speed rpm : 150  
 Minimum rack travel: 19,00  
 Speed rpm : 375  
 Rack travel in mm : 7,40...7,60

Rack travel in mm : 4,00  
Speed rpm : 450...470  
Speed rpm : 600  
Maximum rack trave: 1,00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 9,00  
2nd speed rpm : 800  
Rack travel in m: 9,80...9,90  
3rd speed rpm : 400  
Rack travel in m: 10,50...10,70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 600  
Del.quantity cm3/ : 85,5...88,5  
1000 s: (84,5...89,5)  
Speed rpm : 500  
Del.quantity cm3/ : <89,5  
1000 s: (-)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 8,00  
Speed rpm : 1040...1055

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 124,0...135,0  
1000 s: (-)

#### HIGH IDLE

1st version  
Speed rpm : 1090  
Del.quantity cm3/ : 9,5...17,5  
1000 s: (-)

#### LOW IDLE

Speed rpm : 375  
Del.quantity cm3/ : 15,5...19,5  
1000 s: (-)

Remarks: